OSWER 9240.0-35
EPA540-R-00-003

FINAL AUGUST 2004

Office of Superfund Remediation and Technology Innovation

Contract Laboratory Program Guidance for Field Samplers

Disclaimer: This final version of the document replaces any prior versions of the document in their entirety.

Foreword

The intent of the *Contract Laboratory Program Guidance for Field Samplers* is to replace the *CLP Samplers Guide*. This guidance document is designed to provide users with general information regarding environmental sample collection for the United States Environmental Protection Agency's (USEPA's) Contract Laboratory Program (CLP). This document provides minimum CLP requirements, an explanation of the general sampling process sequence of events, and any related information. The appendices contain useful reference information and checklists to aid in planning and documenting sampling activities.

CLP users also are encouraged to review the *Introduction to the Contract Laboratory Program* document that contains a general overview of the CLP, how it works, and how to access the program. The CLP requires samplers to use the functionality provided by the Field Operations Records Management System (FORMS) II Lite™ software, which is the preferred means of creating CLP sample documentation. For guidance in using the software to record and submit sampling data, users should reference the *FORMS II Lite User's Guide*.

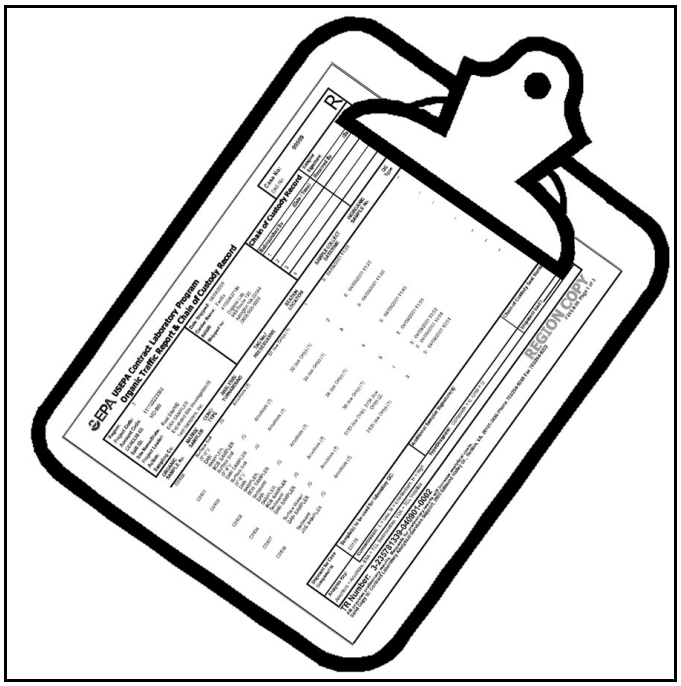
Both the *Introduction to the Contract Laboratory Program* and the *Contract Laboratory Program Guidance for Field Samplers* can be downloaded from the CLP Web site at the following address:

http://www.epa.gov/superfund/programs/clp/guidance.htm

The *FORMS II Lite User's Guide* can be downloaded from the CLP Web site at the following address:

http://dyncsdao1.dyncorp.com/itg/forms2lite/documents/51docs/UserGuide51.pdf

For more information regarding the CLP or this guide, please contact Anand Mudambi via email at mudambi.anand@epa.gov, or via telephone at (703) 603-8796.



List of Figures

List of Tables

ASB	Analytical Services Branch
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLP	Contract Laboratory Program
CLP PO	Regional CLP Project Officer
CVAA	Cold Vapor Atomic Absorption
DOT	Department of Transportation
DQO	Data Quality Objective
FORMS II Lite™	Field Operations Records Management System II Lite
FSP	Field Sampling Plan
GFAA	Graphite Furnace Atomic Absorption
IATA	International Air Transport Association
ICP-AES	Inductively Coupled Plasma-Atomic Emission Spectroscopy
ICP-MS	Inductively Coupled Plasma-Mass Spectrometry
MS	Matrix Spike
MSD	Matrix Spike Duplicate
OSC	On-scene or On-site Coordinator
OSRTI	Office of Superfund Remediation and Technology Innovation
OSWER	Office of Solid Waste and Emergency Response
PCBs	Polychlorinated Biphenyls
PE	Performance Evaluation
PM	Program Manager
ppb	Parts-Per-Billion
ppt	Parts-Per-Trillion
PRP	Potentially Responsible Party
PTFE	Polytetrafluoroethylene
PVC	Polyvinyl Chloride
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QASPER	Quality Assurance Sampling Plan for Environmental Response
QATS	Quality Assurance Technical Support
QC	Quality Control
RAS	Routine Analytical Services
RPM	Remedial Project Manager
RSCC	Regional Sample Control Center
RSM	Regional Site Manager
SAM	Site Assessment Manager
SAP	Sampling Analysis Plan
SARA	Superfund Amendments and Reauthorization Act
SDG	Sample Delivery Group
SMC	System Monitoring Compound
SMO	Sample Management Office
SOP	Standard Operating Procedure
SOW	Statement of Work
SVOA	Semivolatile Organic Analyte
TR/COC	Traffic Report/Chain of Custody Record
USEPA	United States Environmental Protection Agency
VOA	Volatile Organic Analyte

1.0 INTRODUCTION

1.1 About this Guide

This document is intended to guide those who plan and conduct environmental sample collection projects for analysis through the Superfund's Contract Laboratory Program (CLP). This chapter describes the structure and purpose of this document. Chapter 2, *Pre-field Activities*, addresses pre-field planning activities that the sampling team could complete prior to the actual sampling event. Chapter 3, *In-field Activities*, addresses those activities that need to be completed during the sampling event.

Appendix E contains checklists to help the sampler ensure that all necessary steps are completed.

Note: A project and site-specific Quality Assurance Project Plan (QAPP) providing any Regional guidance will override guidance given within this document.

1.2 Overview of the CLP

The CLP is a national program of commercial Laboratories under contract to support the United States Environmental Protection Agency's (USEPA's) nationwide effort to clean up designated hazardous waste sites by supporting the USEPA's Superfund program. The Superfund program was originally established under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 and presently exists under the Superfund Amendments and Reauthorization Act (SARA) of 1986.

The CLP uses state-of-the-art technology to provide users with analytical services. The program provides data of known and documented quality to support USEPA enforcement activities or other user needs. To achieve this goal, the CLP has established strict Quality Control (QC) procedures and detailed documentation requirements. Current CLP users include the USEPA Regions, States and Tribal governments, and other Federal agencies. CLP users also are encouraged to review the *Introduction to the Contract Laboratory Program* document that contains a general overview of the CLP, how it works, and how to access the program.

1.2.1 Key Players Within the CLP

In coordinating Superfund sampling efforts, the Analytical Services Branch (ASB) is supported by the Sample Management Office (SMO) contractor, the Regional CLP Project Officers (CLP POs), the Regional Sample Control Center (RSCC) Coordinators, and the Regional Site Managers (RSMs), including Site Assessment Managers (SAMs), On-scene/On-site Coordinators (OSCs), and Remedial Project Managers (RPMs). Samplers may work directly with the RSCC Coordinator and/or RSM (or equivalent), and/or an OSC from the field support section during a sampling event. See Table 1-1 for a brief description of the functions performed by key participants (functions may vary by Region).

Table 1-1. Participants in the CLP

Participants in the CLP Program	Responsibilities
Analytical Services Branch (ASB)	USEPA ASB directs the CLP from within the Office of Superfund Remediation and Technology Innovation (OSRTI) in the Office of Solid Waste and Emergency Response (OSWER). ASB responsibilities include: • Development of the Statements of Work (SOWs) that define required analytical methods (including QC, detection/quantitation limits, and holding times) for the analytical services procured under the CLP; • Development and implementation of policies and budgets for Superfund analytical operations; • Development of information management policies and products for analytical data; • Management of CLP SMO and Quality Assurance Technical Support (QATS) contracts; • National administration, evaluation, and management of the CLP; and • Direction of CLP Quality Assurance (QA) activities in coordination with overall OSWER QA activities. To obtain the most current ASB contact list, refer to the following Web site: http://www.epa.gov/superfund/programs/clp/contacts.htm#ASB
CLP Sample Management Office (SMO)	Provides necessary management, operations, and administrative support to the CLP. The SMO contractor receives Regional analytical requests, coordinates and schedules sample analyses, and tracks sample shipments and analyses. The SMO contractor also receives and checks data for completeness and compliance, processes laboratory invoices, and maintains a repository of sampling records and program data.
Regional CLP Project Officer (CLP PO)	Monitors the technical performance of the contract laboratories in each Region. The CLP PO works closely with ASB Program Managers (PMs) to identify and resolve laboratory technical issues, and leads laboratory on-site evaluations. The CLP PO (or their designee) is the sole Regional official who contacts the CLP laboratories. To obtain the most current CLP PO contact list, refer to the following Web site: http://www.epa.gov/superfund/programs/clp/polist.htm
Regional Sample Control Center (RSCC) Coordinator	In most Regions, the RSCC Coordinator coordinates sampling efforts and serves as the central point-of-contact for sampling questions and problems. The RSCC Coordinator works with SMO to schedule sample shipments to laboratories. In addition, the RSCC Coordinator's activities may include: providing monthly projections; and informing SMO of sample shipment, cancellations, special instructions, and sampling issues. To obtain the most current RSCC Coordinator contact list, refer to the following Web site: http://www.epa.gov/superfund/programs/clp/rscclist.htm
Regional Site Manager (RSM)	Coordinates the development of acceptance or performance criteria and oversees project-specific contractors, state officials, or private parties conducting site sampling efforts. The RSM could be the Site Assessment Manager (SAM), the On-scene/On-site Coordinator (OSC), or the Remedial Project Manager (RPM).
Field Support Section	The Field Support Section consists of personnel such as the OSC, SAM, and RPM. In most Regions, the Field Support Section develops Standard Operating Procedures (SOPs) for field sampling and related procedures, and assists sampling teams in following those SOPs. The sampling team determines what type(s) of CLP services will be required or a particular sampling event. The Field Support Section reviews Sampling Analysis Plans (SAPs) prepared by sampling teams and oversees sampling teams in the field. They also prepare their own SAP, perform sampling activities in the field, and analyze and report the results of their sampling events to the RSM.

1.3 Overview of the Sampling Process

At-a-Glance:
Overview of the Sampling Process.

- ✔ Procedures must be consistent.
- ✔ Analytical data must be accurate and defensible.
- ✔ Sampling procedures and guidelines must meet CLP and Regional requirements.

Once USEPA has determined that physical, chemical, and biological testing of a site is necessary, samples of material from the investigated area must be collected. The type of material that must be collected and the analytical method to be used depends upon the physical location of the site, detection level(s), site history (previous sampling), and known vs. unknown conditions and contaminants. The sampling process includes carefully planned and consistently applied procedures that produce accurate and legally defensible data. The sampling team should consider the procedures and plans presented in this guide as minimum sampling process guidelines to maintain sample integrity and identity. Samples should be collected according to the approved project and site-specific QAPP and SAP. This document does not define specific sampling procedures for sampling because specific sampling protocols depend on individual site conditions, Regional requirements, and acceptance and performance criteria. Since Regions may have their own specific requirements for individual sampling programs, they are responsible for generating Region-specific sampling SOPs.

1.3.1 Procedures Must be Consistent

The purpose of sampling is to collect representative portions from a suspected contaminated site. Sample collection is critical to determining the presence, type, concentration, and extent of environmental contamination by hazardous substances, thus it is a crucial part of every sampling and environmental testing effort. Sampling procedures must be consistently written and followed to mitigate risk of error and the expense of re-sampling.

Failure to follow proper sampling and shipping procedures could result in samples that are contaminated, broken, mislabeled, lost during shipping, or unusable because of a missed holding time. If procedures are inconsistently or improperly followed, any resultant analytical data may be inaccurate and may not be defensible in a court of law.

Note: If re-sampling is needed due to improper sampling, the sampling team may incur the cost.

1.3.2 Site Data Must be Accurate and Defensible

The data gathered during sampling activities helps to accurately characterize contaminated waste sites so that the impact on human health and the environment can be properly evaluated. Acquiring accurate and defensible data that will be accepted in a court of law is the CLP's primary objective; therefore, the sampler must collect samples according to strict sampling procedures, plans, and guidelines. USEPA and many other Federal agencies use data resulting from analytical testing of soil/sediment/aqueous samples to:

- Determine if a site is contaminated with organic and/or inorganic compounds;

- Identify pollution sources and Potentially Responsible Parties (PRPs);
- Validate remedial design methodologies;
- Assess response and remedial priorities;
- Assess risk to human health and the environment;
- Determine appropriate cleanup actions; and
- Determine cleanup achievements.

1.3.3 Sampling Procedures and Guidelines Must Meet Minimum Requirements

It is imperative that sampling personnel be aware of the minimum CLP and Regional requirements that directly impact and define how a sampling event will take place. It is important to note that the procedures and guidelines set forth in this document are considered minimum CLP requirements. Samplers should reference the following sections within this document that specifically address important requirements that must be met for a successful sampling event:

- Section 1.4.1 CLP Documentation Requirements;
- Section 2.4.1 Request Scheduling of Analysis, Case and CLP Sample Numbers, and Laboratory Contact Information;
- Section 2.7 Comply with Transportation and Shipping Requirements;
- Section 2.8 Provide Shipment Notification;
- Section 3.1 Collecting Samples; and
- Section 3.2 Complete Required Documentation.

1.4 Overview of Sampling Documentation Requirements

The sampler must properly document samples collected for analysis to uniquely identify each sample and ensure adequate chain-of-custody procedures. When collecting samples, the sampler should always keep in mind that any samples collected could one day be used in litigation. This is especially important when samples from privately owned property. If sampling on privately owned property, samplers should also provide the property owner with a receipt for samples collected and removed from that owner's property. Samplers may also be required by a Region to use a sample label, sample tag, or field operations records documenting information such as daily activities, equipment and materials used, personnel involved, site security, etc. These types of documentation help ensure proper sample identification and provide additional chain-of-custody records.
The documentation required by a Region for a sampling event is outlined in project plans such as the QAPP, SAP, and Field Sampling Plan (FSP).
CLP Sample Numbers are provided to samplers by their RSCC Coordinator.

At-a-Glance:
Overview of Sampling Document Requirements.

✔ Must use FORMS II Lite to create sample documentation.

✔ CLP documentation requirements:
- CLP Sample Number
- SMO-assigned Case Number
- Traffic Report/Chain of Custody (TR/COC) Record
- Sample Labels
- Sample Tags
- Custody Seals
- Field Operation Records

Note: Under no circumstances should the site name appear on any documentation being sent to the laboratory.

1.4.1 CLP Documentation Requirements

Sampling personnel must:

1) Record the CLP Sample Number on each sample bottle;
2) Record the SMO-assigned Case Number on each sample bottle and all of the associated sample documentation;
3) Complete the Traffic Report/Chain of Custody (TR/COC) Record using the Field Operations Records Management System Lite (FORMS II Lite) software, making sure to indicate on the form if you used a Method Flexibility Clause;
4) Complete and attach sample labels;
5) Complete and attach sample tags;
6) Complete and attach custody seals to meet Regional requirements; and
7) Complete field operations records, as necessary.

Please contact your RSCC Coordinator (see Table 1-1) for information regarding CLP Sample Numbers, SMO-assigned Case Numbers, TR/COC Records, and chain-of-custody seals for sampling events.

For information regarding using FORMS II Lite to create and complete a TR/COC Record, refer to the following Web site:

http://www.epa.gov/superfund/programs/clp/f2lite.htm

1.4.1.1 CLP Sample Number

A CLP Sample Number is unique per sample and is used to identify and track a particular sample. CLP Sample Numbers are used to track samples throughout the sampling and analytical processes and are recorded on many types of sampling documentation (e.g., TR/COC Records, sample labels, and sample tags).

Samplers must contact their RSCC Coordinator (or their designee) to obtain CLP Sample Numbers for their sampling event. Sampling personnel must correctly assign the CLP Sample Numbers to the appropriate sample bottle or container. Please refer to Section 3.2.1 for more detailed information regarding use of CLP Sample Numbers.

Note: If the sampler has any questions regarding the assignment of CLP Sample Numbers, they should contact their RSCC Coordinator.

1.4.1.2 SMO-assigned Case Number

SMO-assigned Case Numbers are used to track groups of samples throughout the sampling and analytical processes and are recorded on many types of sampling documentation (e.g., TR/COC Records, sample labels, and sample tags). Sampling personnel must correctly assign the SMO-assigned Case Number to the appropriate sample bottle or container. Samplers must contact their RSCC Coordinator (or their designee) to obtain a SMO-assigned Case Number.

1.4.1.3 Laboratory Assignment

Samplers are responsible for shipping samples to the appropriate SMO-assigned laboratory for analysis. Samplers must contact their RSCC Coordinator (or their designee) to obtain their laboratory assignment.

1.4.1.4 Traffic Report/Chain of Custody (TR/COC) Record

The TR/COC Record is used as physical evidence of sample custody and functions as a permanent record of each sample collected. **Per CLP documentation requirements, a separate TR/COC Record must accompany every cooler that is shipped by sampling personnel.**

In an effort to automate sample documentation in the field, ASB has developed a stand-alone, Windows-based software application that samplers can use to automatically create and generate sample documentation. The FORMS II Lite software allows users to enter information prior to and during sampling events. It allows users to multi-task and electronically create, edit, then print documentation associated with sampling activities. Users can customize data entry screens to view data throughout the entire documentation process. Users can also customize the format and content of sample labels based on specific requirements.

The program simplifies and accelerates the tedious manual sample documentation process by reducing the generation of handwritten documents by almost 70%. The FORMS II Lite software enables sampling personnel to:

- Generate CLP Sample Numbers or manually assign their own unique, project-specific CLP Sample Numbers;
- Input the SMO-assigned Case Number into the appropriate field;
- Create sample labels, sample tags, TR/COC Records, Field Weight forms, and receipts for samples taken from a site;
- Track samples from the field to the laboratory;
- Electronically capture sample information into databases; and
- Export electronic data as a Data Base File (.dbf) , Text (.txt), or eXtensible Markup Language (.xml) file.

USEPA requires samplers to use the FORMS II Lite software for all CLP sampling efforts. For assistance with obtaining or using the FORMS II Lite software, please contact the FORMS II Lite Help Desk at 703-818-4200 from 9:00 AM - 5:00 PM Eastern Time (ET). For additional information regarding FORMS II Lite use and training, please refer to the following Web site:

http://www.epa.gov/superfund/programs/clp/f2lite.htm

1.4.1.5 Chain-of-Custody Seals

A chain-of-custody seal is any adhesive label or tape that can be used to seal a sample bottle, container, plastic bag, or shipping cooler such that if it is opened or tampered with, the seal will be broken. Custody seals must be placed on each sample bottle, container, or bag (as appropriate) and each shipping cooler or container.

1.4.1.6 Sample Labels

A sample label is an identification label attached to a sample bottle or container that contains a sample. Sample labels are affixed to each sample container as samples are collected in the field. A sample label must contain, at a minimum, a CLP Sample Number and a SMO-assigned Case Number so that they can be associated with, and listed on, the associated TR/COC Record and chain-of-custody paperwork. The sample label must also include the required analysis/fraction and preservative used (to eliminate confusion at the laboratory). Sampling personnel should refer to their project plans for Region-specific sample label requirements.

1.4.1.7 Sample Tags

A sample tag identifies a sample bottle or container that contains a sample. The tag also provides specific analytical direction and proof that a sample existed. To support the use of sample data in potential enforcement actions, samples with other than *in situ* measurements (e.g., pH, temperature, conductivity) can be identified with a sample tag. A CLP Sample Number and SMO-assigned Case Number must be recorded on a sample tag to indicate that the sample container comprises the whole sample in the case where there is just one container of sample, or part of the indicated sample in the case of multiple containers of sample. Sampling personnel should refer to their project plans for Region-specific sample tag requirements.

1.4.1.8 Field Operation Records

Sampling personnel should maintain complete, accurate, and legible field operations records as they perform a sampling activity. The following records are included: Field Logbooks; Corrective Action Reports; Sampling Trip Reports; supplemental standardized forms; logs; and records such as maps or photographs that document each step of the work performed in the field. Sampling personnel should refer to their project plans for Region-specific field operations record requirements. These records are very important tools because they are considered part of the official project file when legal issues arise.

2.0 PRE-FIELD ACTIVITIES

This chapter provides instructions for completing the suggested pre-field activities that samplers could complete prior to performing sampling activities. These important pre-field activities will save time and help the sampler to better prepare for the sampling event. Samplers should be aware of issues faced during the sampling process on a regular basis so that sampling personnel can strive to avoid making the same mistakes or having the same problems that could adversely affect their sampling event. Samplers are also expected to review all pertinent project plans and meet both Contract Laboratory Program (CLP) and Regional requirements that directly impact the structure and purpose of a sampling event.

At-a-Glance:
Pre-field Activities.

- ✔ Understand why preparation for a sampling event is so important!
- ✔ Review project plans containing Regional requirements.
- ✔ Plan to meet documentation requirements.
- ✔ Obtain any necessary permits, licenses, and clearances.
- ✔ Identify and obtain sampling materials.
- ✔ Comply with transportation and shipping requirements.
- ✔ Provide shipment notification.
- ✔ Perform readiness review/dry run.

The project plans provide information such as the type and numbers of samples to be collected, the analytical methods to be used based on the desired level of quantitation, and the necessary equipment and supplies. The plans also describe the sampling method which may require different specific sample volumes/masses, containers, preservation, shipping, and handling to maintain the integrity of the samples without degradation or contamination.

In addition to reviewing project plans, sampling personnel should determine if the sampling site is privately or publicly owned and obtain the necessary permission to access the sampling site. If the site is privately owned, sampling personnel should make sure to have receipts for samples available to provide to the owner for all samples taken and removed from their property. Sampling personnel must also prepare to identify and obtain sampling materials, prepare to meet documentation requirements by obtaining and learning to use the software used for such purposes, comply with transportation and shipping requirements, and perform a readiness review/dry run of the sampling process.

2.1 Why Preparation for a Sampling Event Is Important

Personnel must prepare to meet CLP requirements for a sampling event, appropriately use the CLP Sample Number and Sample Management Office (SMO)-assigned Case Number, complete the Traffic Report/Chain of Custody (TR/COC) Record using the Field Operations Records Management System Lite (FORMS II Lite) software, and complete and attach the custody seal(s). It is very important that the sampler include the correct CLP Sample Number and SMO-assigned Case Number on each sample. It is also imperative that the TR/COC Record be accurately completed and submitted with the sample(s). Finally, the sampler must accurately and legibly complete and attach a custody seal to each sample bottle, container, or plastic sample bag (as appropriate), and each shipping cooler or container. The custody seal is an excellent means of maintaining a record of chain-of-custody, as well as guarding against possible sample contamination or tampering during shipping.

However, meeting the sampling requirements requires more than just the proper application of a CLP Sample Number on each sample, completion of the TR/COC Record, and use of a custody seal. The actual collection of samples, packaging, and shipping of those samples are equally important to a successful sampling event.

For example, if a sampler collects an insufficient volume of a sample, the laboratory will not be able to perform the requested analysis. Insufficient sample volumes will also result in a laboratory being unable to analyze a Matrix Spike/Matrix Spike Duplicate (MS/MSD). Finally, if the laboratory receives a sample that is either unpreserved or the sample pH is outside of the required range, the sample cannot be properly analyzed.

Unfortunately, improper shipping and labeling processes and procedures often result in:

- Samples being shipped to the wrong laboratory;
- Broken or empty samples being received at the laboratory; and
- Custody seals or sealant tape that is missing or broken on sample bottles, containers, plastic bags, or shipping coolers shipped to the laboratories.

The importance of completing the paperwork associated with a sampling event cannot be overemphasized. Sampling personnel must make a conscientious effort to accurately complete the TR/COC Record since this is the main document used to derive vital information about a particular sample. The person completing a TR/COC Record must be careful to avoid errors such as the appropriate sample(s) not being listed, or the wrong samples being listed. In an effort to eliminate such errors and the confusion that can be associated with handwritten TR/COC Records, samplers must use the Field Operations Records Management System (FORMS) II Lite software to complete the TR/COC Record and other associated sampling documentation.

It is extremely important that Quality Control (QC) samples, including Performance Evaluation (PE) samples, be designated and labeled per Regional guidance by samplers in the field. Mislabeling of QC samples can result in improper and/or inaccurate analysis of a sample at the laboratory.

2.2 Why Communication During a Sampling Event Is Important

Communication is a key element in the planning, administrating, and conducting of a sampling event. It is extremely important that all parties involved in a sampling event be in contact throughout the sampling process. The procedures and recommendations outlined in this guide are based on over 20 years of experience that have demonstrated that approximately 50% of all sampling efforts have been negatively affected by incorrect sampling procedures and poor communication among participants.

The key elements of communication for a sampling event include the relationship between the Regional Sample Control Center (RSCC) Coordinator, CLP SMO, the samplers in the field, and the laboratories who will be accepting the samples. For instance, the samplers must contact the RSCC Coordinator to start the process for setting up a sampling event. The RSCC Coordinator will in turn contact CLP SMO who will schedule the sampling event, establish laboratory availability, and arrange for the laboratory to accept projected samples.

It is imperative that the sampler contact the RSCC Coordinator (per Regional guidelines) and allow enough time for the RSCC Coordinator to contact CLP SMO by 12:00 PM Regional Time on the Wednesday prior to the week of the sampling event.

This will enable CLP SMO to provide SMO-assigned Case and CLP Sample Numbers in time for the sampling event. It will also enable CLP SMO to schedule a laboratory and to make sure the laboratory will not have any capacity problems. Communication is also important because if there is a change in the sampling event due to a cancellation or an increase or decrease in the number of samples that will be sent to the laboratory, the sampler can contact the RSCC Coordinator who can work with CLP SMO to remedy potential capacity, availability, or overbooking problems.

2.3 Review Project Plans Containing Regional Requirements

In addition to meeting CLP requirements, the sample collection process must fulfill numerous Regional requirements. These requirements are determined by a variety of factors that affect how samples should be collected for an individual sampling event. These factors include:

- The type of samples being collected (organic/inorganic, water, or soil/sediment);
- How the samples will be analyzed;
- Acceptance or performance criteria (i.e., Data Quality Objectives [DQOs]); and
- The type of data needed.

The Quality Assurance Project Plan (QAPP) for each sampling project is written to meet requirements outlined in the documents *EPA Requirements for Quality Assurance Project Plans* (QA/R-5), *EPA Guidance on Quality Assurance Project Plans* (G-5), and Regional QAPP preparation documents. The QAPP is prepared in advance of field activities and is used by sampling personnel to develop any subsequent plans such as the Sampling and Analysis Plan (SAP) or the Field Sampling Plan (FSP). Samplers should review the QAPP and any subsequent project plans for information outlining the basic components of a sampling activity. QAPP and project plans should be finalized and approved by appropriate Regional QA personnel, the On-Scene/On-Site Coordinator (OSC), the Site Area Manager (SAM), or the Remedial Project Manager (RPM) before providing them to the sampling team. This should be done prior to the start of field activities. Appendix A explains the functions within a sampling project (as these functions relate to a sampling event) and the elements of that function as described in a typical QAPP. Copies of all project plans and relevant Standard Operating Procedures (SOPs) should be maintained in the field for the duration of the sampling project.

2.4 Plan to Meet Documentation Requirements

At-a-Glance:
Plan to meet documentation requirements.

- ✔ Request SMO-assigned Case and CLP Sample Numbers.
- ✔ Sample cooler return documentation.
- ✔ Prepare to use the FORMS II Lite software.

Sampling events require a variety of accurate and complete documentation. Sampling personnel should review their project plans to determine the types of documentation that must be completed for a sampling project and to ensure that the appropriate documentation will be on-hand in the field. The CLP documentation requirements includes the CLP Sample Number, the SMO-assigned Case Number, the TR/COC Record, sample labels, sample tags, custody seals, and field operations records (as necessary). Sampling personnel will need to request SMO-assigned Case and CLP Sample Numbers for each sampling event prior to starting field activities. Sampling personnel will also need to make sure that the correct TR/COC Records (Organic TR/COC Record for organic analysis or Inorganic TR/COC Record for inorganic analysis) are being used within the FORMS II Lite software. Finally, sampling personnel should be prepared to complete the appropriate shipping cooler return documentation.

Since sampling personnel are required to use the FORMS II Lite software to prepare and submit sampling project documentation and maintain sample chain-of-custody, software users must be apprized of all emergency back up procedures that should be followed in the event of a system failure. Samplers must have access to FORMS II Lite-generated TR/COC Records at sampling events. In the event that the system crashes, samplers must have backup hardcopies of FORMS II Lite TR/COC Records. For information regarding emergency backup procedures, please refer to the following Web site:

http: //www.epa.gov/superfund/programs/clp/trcoc.htm

2.4.1 Request Scheduling of Analysis, SMO-assigned Case Numbers, CLP Sample Numbers, and Laboratory Contact Information

SMO-assigned Case Numbers are assigned based on a request for CLP Routine Analytical Services (RAS), which is processed though the RSCC Coordinator (or their designee). The sampler must request the RSCC Coordinator to schedule CLP RAS analysis. The sampler must make the request such that the RSCC Coordinator can contact CLP SMO by 12:00 PM Regional Time on the Wednesday prior to the week of the sampling event. The sampler should receive SMO-assigned Case and CLP Sample Numbers from the RSCC Coordinator (or their designee) particular to the sampling event by Friday afternoon before the start of sampling activities. The CLP does have the capacity to schedule sampling on an emergency basis, however the sampler must contact the RSCC Coordinator (or their designee) to obtain details regarding how to handle such a situation. When scheduling a sampling event that will last for more than one week, it is recommended that the sampler contact the RSCC Coordinator (or their designee) on a weekly basis to provide updates. This contact between the sampler, RSCC Coordinator (or their designee), and CLP SMO is very important because it will ensure better availability of laboratory capacity.

In addition to SMO-assigned Case and CLP Sample Numbers, samplers should make sure to have accurate laboratory contact information to include:

- Laboratory name;
- Laboratory address;
- Contact name; and
- Laboratory phone number.

This information is used for both TR/COC Records and chain-of-custody documentation and shipping paperwork such as address labels and airbills.

The RSCC Coordinator (or their designee) provides the CLP Sample Numbers for each sampling event to sampling personnel. Once the CLP Sample Numbers have been provided to the sampler, the sampler can use FORMS II Lite to print them onto sample labels. The following characters are not to be used in generating CLP Sample Numbers and should never appear on any paperwork submitted to the laboratory: I; O; U; and V.

A CLP *Sample Number* is defined as a number that is unique per sample and identifies each CLP sample (see Section 1.4.1.1). Since samples must be identified per analytical program (i.e. organic or inorganic), there are two types of TR/COC Records and two letter codes to denote organic vs. inorganic analysis.

A CLP *sample* is defined as one sample matrix, at one concentration level, from one station location for each individual or set of analytical fractions -- provided the fractions are all requested for the same CLP analytical service (i.e., organic or inorganic).

Note: When samples are collected from several station locations to form a composite sample, the composite sample should be assigned either a number from one of the station locations used during collection, or a unique number that represents the composite sample for tracking purposes. The numbering scheme used internally at a sampling event for identifying composite samples should also be documented appropriately (e.g., in the field logs).

Organic CLP Sample Numbers begin with the Regional letter code, followed by letters and numbers. Inorganic CLP Sample Numbers begin with "M", followed by the Regional letter code and then letters and numbers. See Table 2-1 for Region and letter codes for each sample type (i.e., organic or inorganic).

Table 2-1. CLP Sample Number Letter Codes

Region	Letter Code	
	Organic	Inorganic
I	A	MA
II	B	MB

Table 2-1. CLP Sample Number Letter Codes (Con't)		
Region	**Letter Code**	
	Organic	**Inorganic**
III	C	MC
IV	D	MD
V	E	ME
VI	F	MF
VII	G	MG
VIII	H	MH
IX	Y	MY
X	J	MJ

According to CLP guidelines, each individual inorganic water sample may be analyzed for total metals or dissolved metals, but not both. Therefore, water samples collected for total metal and dissolved metal analyses must receive separate (unique) CLP Sample Numbers. A sampler can use one CLP Sample Number for an inorganic soil or water sample collected for both total metals and cyanide analyses.

Organic soil and water samples may be collected for analysis under the OLM04.3 SOW to detect:

- Semivolatile Organic Analytes (SVOAs); and/or
- Pesticides and Polychlorinated Biphenyls (PCBs); and/or
- Volatile Organic Analytes (VOAs).

Organic water only samples may be collected for analysis under the OLC03.2 SOW to detect:

- SVOAs; and/or
- Pesticides and PCBs; and/or
- VOAs.

Inorganic soil and water samples may be collected for analysis for cyanide, and for metals using Inductively Coupled Plasma-Atomic Emissions Spectroscopy (ICP-AES) and Cold Vapor Atomic Absorption (CVAA), under the ILM05.3 SOW.

Inorganic water only samples may be collected for analysis for cyanide, and for metals using Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) and CVAA, under the ILM05.3 SOW.

Samplers should check with their RSCC Coordinator to verify what samples are scheduled to be collected for analysis.

2.4.2 Prepare Sample Cooler Return Documentation

CLP Laboratories must routinely return sample shipping coolers to the appropriate sampling office within 14 calendar days following receipt of shipment from the sampler. In order for sample coolers to be returned, the sampler must complete the appropriate cooler documentation and work with Regions and government agencies to provide a cost-effective mechanism for laboratories to return the empty coolers to the appropriate sampling office. The sampling cooler return documentation can be prepared in advance and provided to sampling personnel before field activities begin. **The sampler (<u>not</u> the CLP laboratory) is responsible for paying for return of the cooler and should also include shipping airbills bearing the sampler's account number, as well as a return address to allow for cooler return.**

To maintain consistency among cooler transportation programs, samplers should:

- Minimize the use of multiple transportation carriers to avoid confusion;
- Use multiple-copy labels so the laboratory and the sampling team can each retain a copy for their records;
- Prepare labels in advance so that the laboratory can simply affix a completed shipping label on the cooler;
- Include third-party billing information (i.e., their shipping account number) on labels so the laboratory will not be billed by the transportation carrier;
- Confirm that the laboratory knows which transportation carrier to use; and
- Include the SMO-assigned Case Number on return information.

2.5 Obtain Municipal Permits, Licenses, and Clearances

Before starting a sampling event, samplers must make sure to obtain the proper municipal permits, accesses to the property, and any government clearances, if required. The sampler must also contact any appropriate utility companies to ascertain where any underground pipes, cables, etc., may be located.

At-a-Glance:
Obtain permits, licenses, and clearances.

- ✔ Request access to County, State, Tribal, military, and/or Federal property.
- ✔ Contact private property owner(s).
- ✔ Contact utility companies.

2.5.1 Request Access to County, State, Tribal, Military, and/or Federal Property

Proper access to perform sampling activities is important not only for legal reasons, but also to eliminate delays in work and possible refusal to allow sampling to take place. It is crucial that the appropriate permits, licenses, and clearances be secured to obtain access for sampling activities that will be performed on County, State, Tribal, military and/or Federal property. The sampler must contact the appropriate government offices or personnel well in advance to determine what kinds of approval are required. Pre-approval may be required for specific types of sample collection such as drilling or excavation. For example, drilling on a military base requires pre-approval. Base security may require clearances for all members of the sampling team, including subcontractors. This process may take two or more days.

If arrangements are not made in advance, the team may not be allowed to the enter the site until their clearances are processed and the team has been approved to drill. As a result, the sampling schedule is delayed, costing extra time and money.

2.5.2 Contact Private Property Owners

The sampler must obtain written permission from the private property owners before sampling on their property, even if verbal permission has been granted. It is recommended that samplers obtain written permission prior to their arrival at the sampling location, but written permission can be obtained on the day of sampling. If a property owner refuses to grant access to their property, it may be necessary for sampling participants to contact the appropriate authorities for assistance.

2.5.3 Contact Utility Companies

The sampler should contact local utility companies (e.g., power, phone, gas, cable, sanitation, etc.) at least one week prior to the sampling event to have underground cables, lines, and pipes flagged and marked. This is required by law. A national one-call directory can be found at http://www.digsafe.com/company_onecalldirectory.htm. This will eliminate potential safety hazards and service disruption. For example, soil sampling in a residential area may require digging below the soil's surface. It is very important to know where utility lines and pipes are located so that sampling personnel do not hit live electrical wires or rupture gas lines. Samplers should follow Regional or other appropriate program procedures for the procurement of such services. The utility service(s) disruption dates should be confirmed at least two days prior to sampling activities.

Note: Pre-payment of survey fees to local utility companies may be required.

2.6 Identify and Obtain Sampling Materials

Samplers must make sure to be prepared for a sampling project with the appropriate sampling materials to include equipment, supplies, sample containers, packing materials, and shipping materials. The equipment and supplies must be properly cleaned, calibrated, and tested as necessary to meet the needs of the sampling project.

At-a-Glance:
Identify and obtain sampling materials.

- ✔ Procure appropriate equipment and supplies.
- ✔ Procure sample containers.
- ✔ Procure packing material.
- ✔ Procure shipping supplies.

2.6.1 Procure Appropriate Equipment and Supplies

Each sampling event requires the procurement of equipment and materials to collect, document, identify, pack, and ship samples. The proper field sampling equipment is vital to a successful sample collection. Regional or other sampling personnel should obtain, and arrange in advance, all of the equipment and supplies required for each sampling event. Sampling personnel should review the project plans to verify that the proper equipment is being used for sample collection.

At a minimum, the following materials are generally required during a sampling event:

- Sample storage containers;
- Packing material;
- Sample containers;
- Shipping containers;
- Access to the FORMS II Lite software for creating sample labels, tags, and TR/COC Records;
- Custody seals; and
- Sampling equipment such as bowls, augers, pumps, etc.

Sampling events may also require specific items such as:

- Cooler temperature blanks;
- Trip blanks for VOA analysis;
- Preservation supplies (e.g., ice or acid); and
- Specially prepared sample vials (e.g., for SW-846 Method 5035A).

2.6.2 Procure Sample Containers

The analytical protocol(s) to be used for sample analysis often requires the use of a particular type of sample container. The type of container also may depend on the sample matrix and analysis. For example, samples collected for low-level soil VOA analysis using SW-846 Method 5035A may require the sampler to use pre-prepared, tared closed-system purge-and-trap vials with a preservative (refer to Appendix B).

Using the wrong container may result in breakage, gathering of an insufficient volume needed to perform sample analysis, or the container material may interfere with the analysis. Therefore, sampling personnel should identify and use the correct sample containers for each sampling event.

Note: Extra containers should be provided for each sampling event in case of breakage, loss, or contamination.

Containers procured for a sampling event are usually pre-cleaned and shipped ready-for-use from the manufacturer to the sampling site. Regardless of the type of container used, samplers must ensure that the containers have been analyzed/certified clean to levels below concern for the project. These containers must meet the USEPA container type specifications listed in Table 2-2. The information contained in this table is also cross-referenced in the sample collection parameters discussed in Chapter 3. The container Reference Numbers are used in Tables 3-2 and 3-3 under the Containers column.

It is recommended that samplers use borosilicate glass containers, which are inert to most materials, when sampling for pesticides and/or other organics. Conventional polyethylene is recommended when sampling for metals because of the lower cost and absorption rate of metal ions.

Table 2-2. Container Type Specifications

Reference Number	Container Type	Specifications	
		Closure	Septum
1	40 mL amber glass vial, 24 mm neck finish.	Polypropylene or phenolic, open-top screw-cap, 15 cm opening, 24-400 size.	24 mm disc of 0.005 in Polytetrafluoroethylene (PTFE) bonded to 0.120 in silicone for total a thickness of 0.125 in.
2	1 L high density polyethylene, cylinder-round bottle, 28 mm neck finish.	Polyethylene cap, ribbed, 28-410 size; F217 polyethylene liner.	N/A
3	8 oz short, wide mouth, straight-sided, glass jar, 70 mm neck finish.	Polypropylene or phenolic cap, 70-400 size; 0.015 in PTFE liner.	N/A
4	4 oz (120 mL) tall, wide mouth, straight-sided, glass jar, 48 mm neck finish.	Polypropylene or phenolic cap, 48-400 size; 0.015 in PTFE liner.	N/A
5	1 L amber, Boston round glass bottle, 33 mm pour-out neck finish.	Polypropylene or phenolic cap, 33-430 size; 0.015 in PTFE liner.	N/A
6	500 mL high density polyethylene, cylinder-round bottle, 28 mm neck finish.	Polypropylene cap, ribbed, 28-410 size; F217 polyethylene liner.	N/A
7	Coring tool used as a transport device (e.g., 5 g Sampler).	Has built-in closing mechanism.	N/A
8	250 mL high density polyethylene, cylinder-round bottle, 28 mm neck finish.		N/A

2.6.3 Procure Packing Materials

Samples should be correctly packaged for shipment to the laboratory to eliminate the risk of breakage or spillage and to properly contain certain types of samples. The sampler should refer to their project plans to determine the types of samples to be taken during the sampling project to ensure that he or she is properly prepared to package the sample containers with the appropriate packaging materials. For example, samplers must package certain samples in sample coolers, while others containing hazardous materials must be shipped in metal cans.

2.6.4 Procure Shipping Supplies

Samples should be correctly packaged into the appropriate shipping containers to reduce the risk of breakage or leakage, and the shipping containers should be appropriately prepared for shipment. Before heading into the field, samplers should refer to the appropriate project plans to determine the types of samples that will be taken during the sampling project so that sampling personnel will have the proper packaging materials at the site for all pertinent samples container types and sample matrices. Samplers should also make sure to obtain the appropriate shipping paperwork (e.g., shipping forms).

2.7 Comply with Transportation and Shipping Requirements

Sampling personnel are expected to review the applicable project plans to be aware of all State, Federal, Department of Transportation (DOT), and International Air Transport Association (IATA) regulations governing environmental and hazardous sample packaging. The person who ships the samples is responsible for being in compliance with applicable packaging, labeling, and shipping requirements.

Additional information can be obtained on Hazardous Materials Safety Program regulations from the DOT's Research and Special Programs Administration. Federal transportation regulations can be found in 49-CFR Parts 100-185, are available on the Internet at:

http://www.myregs.com/dotrspa/

2.8 Provide Shipment Notification

Some Regions may require that sampling personnel notify their RSCC Coordinator (or their designee) when samples are shipped. Some Regions allow samplers to contact CLP SMO directly to provide shipment notification. It is recommended that sampling personnel contact the RSCC of sample origin to verify if such notification is necessary.

Regardless of Regional notification requirements, sampling personnel **must immediately** report all CLP sample shipments to the RSCC Coordinator (or their designee) or to CLP SMO. If sampling personnel are shipping samples after 5:00 PM Eastern Time (ET), sampling personnel must notify the RSCC Coordinator (or their designee) or CLP SMO by 8:00 AM ET on the following business day.

Important Note: For Saturday delivery at the laboratory, samplers MUST contact the RSCC Coordinator (or their designee) or CLP SMO such that CLP SMO will receive the delivery information by 3:00 PM ET on the Friday prior to delivery.

2.9 Perform Readiness Review/Dry Run

A readiness review/dry run is a test run of the proposed sampling event. This is a recommended practice since it gives sampling personnel a chance to check all plans, documentation software (i.e., FORMS II Lite), and equipment lists for accuracy and completeness prior to sampling activities. It also provides an opportunity to consult with sampling team members to make sure all the elements are in place and everyone understands their tasking before actually going out to the field. Sampling project managers should provide the test or dry run dates and schedules to samplers so that sampling personnel can prepare accordingly.

If problems are experienced with using the FORMS II Lite software during the readiness review/dry run, please contact the FORMS II Lite Help Desk at 703-818-4200 from 9:00 AM - 5:00 PM ET.

3.0 IN-FIELD ACTIVITIES

This chapter addresses the in-field activities a sampler will focus on during a sampling event such as: determining the type of samples to be collected; collecting the samples; meeting volume, preservation, and holding time requirements; completing documentation; and packing and shipping samples.

When performing a sampling event, the sampler is expected to follow prescribed sampling techniques. The sampler should also be aware of any special sampling considerations, contamination issues, and sample compositing and mixing methods that could affect their sampling efforts. Please refer to Appendix D for more detailed information.

Note: Appropriate Regional guidance and procedures should be consulted for detailed sample collection, preservation, handling and storing, equipment decontamination, and Quality Assurance/Quality Control (QA/QC) procedures.

At-a-Glance:
In-field Activities.

✔ Collecting samples:
- Determine types of samples to be collected.
- Meet volume, preservation, and holding time requirements.

✔ Completing documentation:
- Identify a sample with a Contract Laboratory Program (CLP) Sample Number
- Identify a sample with a CLP Sample Management Office (SMO)-assigned Case Number
- Complete Traffic Report/Chain of Custody (TR/COC) Records.
- Complete and attach sample labels.
- Complete and attach sample tags.
- Complete and attach custody seals.

✔ Sampling considerations:
- General sampling techniques.
- Special sampling considerations.
- Contaminant sampling.
- Sample compositing and mixing.

✔ Packing and shipping samples:
- Sample containers.
- Inventory of samples and documentation.

3.1 Collecting Samples

A CLP sample consists of all sample aliquots (portions):
- for each individual or set of analytical fractions;
- from one station location;
- for one sample matrix;
- at one concentration level;
- for one laboratory; and
- for one analytical program,

provided that the fractions are all requested from the same CLP analytical service.

CLP Routine Analytical Services (RAS) are generally used to analyze samples from Superfund sites. The matrices can be water, soil, or sediment. In some instances, a mixed-matrix sample may be collected which contains either a supernate (for a sediment/soil sample) or a precipitate (for a water sample). In this event, samplers should consult their management plans and/or discuss the required procedures with the Regional Site Manager (RSM) or their designee. In general, it is recommended that two individual samples be collected by separating the aqueous layer from the solid/precipitate layer at the point of collection.

3.1.1 Determine Types of Samples to be Collected

Sampling personnel may be required to take several types of samples or sample aliquots during a sampling event. Samplers should refer to their project plans to determine the types of samples or aliquots to be taken, the volumes needed of each sample or aliquot, and the preservation needed for each sample. For an explanation of the various sample types and the requirements for collecting and submitting each particular type, refer to Table 3-1.

Table 3-1. Quality Control (QC) Sample Types and CLP Submission Requirements

Sample Type	Purpose	Collection [1]	CLP Sample Number
Field Duplicate	To check reproducibility of laboratory and field procedures. To indicate non-homogeneity.	Collect from areas that are known or suspected to be contaminated. Collect one sample per week or 10% (Regions may vary) of all field samples per matrix, whichever is greater.	Assign two separate (unique) CLP Sample Numbers (i.e., one number to the field sample and one to the duplicate). Submit blind to the laboratory.
Field Blanks	To check cross-contamination during sample collection, preservation, and shipment, as well as in the laboratory. Also to check sample containers and preservatives.	Collect for each group of samples of similar matrix per day of sampling. Organics - Use water (demonstrated to be free of the contaminants of concern). Inorganics - Use metal-free (deionized or distilled) water.	Assign separate CLP Sample Numbers to the field blanks.
Trip Blank (Volatile Organic Analysis Only)	To check contamination of Volatile Organic Analyte (VOA) samples during handling, storage, and shipment from field to laboratory.	Prior to going into the field, prepare and seal one sample per shipment per matrix using water demonstrated to be free of the contaminants of concern (deionized water is appropriate). Place this sample in the cooler used to ship VOA samples.	Assign separate CLP Sample Numbers to the trip blanks.
Equipment Blank or Rinsate Blank	To check field decontamination procedures.	Collect when sampling equipment is decontaminated and reused in the field or when a sample collection vessel (bailer or beaker) will be used. Use blank water (water decontamination to be organic-free, deionized or distilled for inorganics) to rinse water into the sample containers.	Assign separate CLP Sample Numbers to the equipment blanks.
Matrix Spike and Matrix Spike Duplicate (MS/MSD)[2] (Organic Analysis Only)	To check accuracy and precision of organic analyses in specific sample matrices.	Collect from areas that are known or suspected to be contaminated. For smaller sampling events (i.e., 20 samples or less), MS/MSD additional volume should be collected in the first round of sampling and included in the first shipment of samples to the laboratory. Collect double or triple volume[3] for aqueous samples and soil VOA samples designated for MS/MSD analyses. Additional sample volume is not required for soil samples requiring Semivolatile Organic Analyte (SVOA) and/or Pesticide/Polychlorinated Biphenyl (PCB) analysis. See Appendix B for VOA collection volumes.	Assign the same CLP Sample Number to the field sample and the extra volume for MS/MSD. Identify the sample designated for MS/MSD on the TR/COC Record.

Table 3-1. Quality Control (QC) Sample Types and CLP Submission Rquirements (Con't)

Sample Type	Purpose	Collection [1]	CLP Sample Number
Matrix Spike and Laboratory Duplicate (Inorganic Analysis Only)	To check accuracy and precision of inorganic analyses in specific sample matrices.	Collect from areas that are known or suspected to be contaminated. For smaller sampling events (i.e., 20 samples or less), Matrix Spike and laboratory duplicates should be collected in the first round of sampling and included in the first shipment of samples to the laboratory. Additional sample volume may be required for inorganic analysis.[4]	Assign the same CLP Sample Number to the field sample and extra volume (if collected). Identify the sample(s) designated for Matrix Spike and laboratory duplicates on the TR/COC Record.
Performance Evaluation (PE) Samples	Specially-prepared QC samples used to evaluate a laboratory's analytical proficiency.	The PE samples contain analytes with concentrations unknown to the laboratory. Designated Regional or authorized personnel (depending on Regional policy) arrange for Case-specific CLP PE samples to be prepared and shipped by the Quality Assurance Technical Support (QATS) contractor. The PE samples can be shipped to the site, or shipped per Regional directon. QATS provides the appropriate preparation instructions and chain-of-custody materials.	Samplers have no direct interaction with the PE sampling process, but should be aware that such samples do exist within the CLP sampling process. Samplers must, however, order PE samples and ship them to the laboratory if required by the Region.

[1] Consult Regional or Project Manager guidance for field QC sample frequencies; laboratory QC sample frequencies are generally fixed in the laboratory subcontracts or specified in analytical methods. Current frequency for MS/MSD (organic) and MS/duplicate (inorganic) for the CLP is one sample per twenty field samples of similar matrix.

[2] Samples sent under the Low Concentration Organic SOW (OLC03.2) do not require an MS or MSD, but the Region may opt to send them at their discretion.

[3] Example of double volume: An aqueous sample for SVOA analysis would require the field sampler to collect at least 2 L of field sample and at least 1 L each for the MS and MSD samples for a total volume of 4 L. If Pesticide/PCB MS/MSD analyses is required for the same sample, an additional 4 L must be collected. Double volume is the MINIMUM allowable volume for samples designated for MS/MSD analysis. Triple volume may be sent for MS/MSD samples to allow for sufficient volume for these analysis in the event sample volume is lost as a result of samples breaking, leaking, or laboratory accidents.

[4] Double volume may be sent for inorganic aqueous MS and laboratory duplicate samples to allow for sufficient volume for these analysis in the event sample volume is lost as a result of samples leaking or laboratory accidents.

3.1.1.1 Collect Field QC Samples

Samplers can collect field QC samples and laboratory QC samples to verify that sample quality is maintained during a sampling project.

Field QC samples are designed to assess variability of the media being sampled and to detect contamination and sampling error in the field. The types of field QC samples that are generally collected include field duplicates and field blanks (such as equipment, trip, or rinse blanks).

Generally, field duplicate samples should remain "blind" to the laboratory (i.e., they should have separate CLP Sample Numbers). The sampler should also prepare them to look identical to field samples (i.e., label, package, and shipment method).

3.1.1.2 Collect Laboratory QC Samples

A laboratory QC sample is an additional analysis of a field sample, as required by the laboratory's contract. There are three types of laboratory QC samples:

- Matrix Spikes (MSs) [for organic and inorganic samples];
- Matrix Spike Duplicates (MSDs) [for organic samples only]; and
- Laboratory duplicates (for inorganic samples only).

Note: Samplers should obtain Regional guidance for MS/MSDs.

Samplers should select one sample per matrix per 20 samples as a "laboratory QC" sample. Designated organic laboratory QC samples should be noted on the Organic TR/COC Record. Designated inorganic laboratory QC samples should be noted on the Inorganic TR/COC Record. The laboratory QC sample must not be designated in the "Field QC Qualifier" column on either the Organic or Inorganic TR/COC Records.

The sampler should select a field sample as the laboratory QC sample. If the sampler does not select a field sample as the laboratory QC sample, then it is possible that the laboratory could select the field blank (e.g., an equipment or rinse blank) sample to meet contractual QC requirements. The use of field blanks for laboratory MS/MSD/duplicate QC analysis reduces the usability of the data to assess data quality.

Extra volumes should be shipped with each group of samples (i.e., with each Sample Delivery Group [SDG]). For organic analyses, extra volumes will be collected in separate containers for MS and MSD samples. Mark these extra volume containers with the CLP Sample Number and "MS/MSD".

Note: In the event of multiple sample shipments during a sampling event, it is recommended that the sampler submit laboratory QC samples in the first sample shipment.

3.1.2 Meeting Volume, Preservation, and Holding Time Requirements

Sampling personnel should refer to their project plans to obtain the specific sample volumes to be collected, the preservation needed for those samples, and the technical holding times under which they must submit samples to the scheduled CLP laboratory. Currently available sample collection parameters (to include sample volumes, preservatives, and technical holding times) for organic collection and analysis are listed in Table 3-2. Sample collection parameters for inorganic analysis and collection are listed in Table 3-3. To determine availability of sampling services, please visit the USEPA Web site at:

http://www.epa.gov/superfund/programs/clp/index.htm

3.1.2.1 Collecting Sample Volume

Collecting sufficient sample volume is critical. There must be sufficient physical sample volume for the analysis of all required parameters and completion of all QC determinations. The type of analytical procedure(s) to be performed will often dictate the sample volume to collect. For example, each water sample collected for VOA analysis by CLP SOW OLC03.2 or OLM04.3 requires a minimum of two vials, each filled completely to a 40 mL capacity. See Appendix C for information regarding the collection of VOAs in water. It is extremely important that sampling personnel refer to their specific project plans to identify and collect the correct sample volume during each sampling event.

When sampling for VOAs in soils, samplers must use SW-846 Method 5035A guidelines included in Appendix B.

3.1.2.2 Preserving Samples

Degradation of some contaminants may occur naturally (e.g., VOAs). The sampler must chemically preserve some water samples for certain analytes before shipping them to the laboratory. The sampler should preserve and immediately cool all samples to 4°C (±2°C) upon collection to time of analysis (do not freeze water samples). Preservation techniques vary among Regions so the sampler should obtain Region-specific instructions and review the appropriate project plans and Standard Operating Procedures (SOPs). See Appendix C for information regarding the collection of VOAs in water.

3.1.2.3 Shipping Within Holding Times

Sampling personnel should ship samples to scheduled CLP laboratories as soon as possible after collection. Daily shipment of samples to CLP laboratories is preferred whenever possible. If samples cannot be shipped on a daily basis, they must be properly preserved and maintained to meet CLP-specified temperatures, holding times, and custody requirements.

The technical holding times are the maximum lengths of time allowed between when a sample is collected and when the extraction and/or analysis is completed. In contrast, contractual holding times are the maximum lengths of time that the CLP laboratory can hold the sample prior to extraction and/or analysis. These contractual holding times are described in the appropriate CLP SOW. Contractual holding times are shorter than the technical holding times to allow for sample packing and shipping.

If sampling personnel are shipping samples after 5:00 PM Eastern Time (ET), they must notify the RSCC Coordinator (or their designee) or CLP SMO by 8:00 AM ET on the following business day. When making a Saturday delivery, samplers **must** contact the RSCC Coordinator (or their designee) or CLP SMO by 3:00 PM ET on the Friday prior to delivery. Samplers should contact their RSCC Coordinator to obtain a CLP SMO contact name and phone number.

Table 3-2. Low Medium and Low Concentration Organic Collection Parameters (SOW OLM04.3 and OLC03.2)

Analysis	Matrix	Containers	Volume/ Mass	Important Notes	Preservative	Technical Holding Time[1]
Volatile Organic Analytes (VOAs)	Water	At least two 40 mL glass containers with Polytetrafluoroethylene (PTFE)-lined septa and open top screw-caps (see Table 2-2, Reference Number 1). If Selected Ion Monitoring (SIM) analysis is requested, at least two additional 40 mL glass containers with PTFE-lined septa and open top screw-caps that are filled to capacity with no air bubbles, preserved to a pH of 2 with HCl, and cooled to 4°C (±2°C) immediately after collection (see Table 2-2, Reference Number 1).	Fill to capacity	Vials must be filled to capacity with no headspace or air bubbles. Refer to Appendix C for samples requiring QC analyses.	Preserve to a pH of 2 with HCl and cool to 4°C (±2°C) immediately after collection.[2] DO NOT FREEZE water samples.	14 days
	Soil/Sediment	Option 1: At least three 40 mL glass containers with PTFE-lined septa and open tip screw-caps, pre-weighed and containing magnetic stir bars (see Table 2-2, Reference Number 1). AND One container of sample filled with no headspace for determination of moisture content.	5 g	Place samples on side prior to being frozen. Refer to Appendix B for samples requiring QC analyses.	Frozen (−7°C and −15°C)	14 days
			5g	Refer to Appendix B for samples requiring QC analysis.	Iced to 4° (±2°C).	48 hours
		Option 2: At least three 40 mL glass containers with PTFE-lined septa and open tip screw-caps, pre-weighed and containing magnetic stir bars (see Table 2-2, Reference Number 1). Two of the containers will also contain 5 mL of water. AND One container of sample filled with no headspace for determination of moisture content.	5 g	Place samples on side prior to being frozen. Refer to Appendix B for samples requiring QC analysis.	Frozen (−7°C and −15°C).	14 days
			5 g	Refer to Appendix B for samples requiring QC analysis.	Iced to 4° (±2°C)	48 hours

Table 3-2. Low Medium and Low Concentration Organic Collection Parameters (SOW OLM04.3 and OLC03.2) (Con't)

Analysis	Matrix	Containers	Volume/ Mass	Important Notes	Preservative	Technical Holding Time[1]
Volatile Organic Analytes (VOAs) (Con't)	Soil/Sediment	Option 3: At least three coring tools used as transport devices (e.g., 5 g Samplers) (see Table 2-2, Reference Number 7). AND One container of sample filled with no headspace for determination of moisture content.	5 g	Refer to Appendix B for samples requiring QC analysis.	Frozen (−7°C and −15°C) or iced to 4° (±2°C).	48 hours
Semivolatile Analytes	Water	At least two 1 L amber glass bottles, fitted with screw-caps lined with PTFE (see Table 2-2, Reference Number 5).	2 L	If amber containers are not available, the samples should be protected from light.	Cool all samples to 4°C (±2°C) immediately after collection. DO NOT FREEZE water samples.	7 days
	Soil/Sediment	Use one 8 oz wide-mouth glass jar or two 4 oz wide-mouth glass jars (see Table 2-2, Reference Numbers 3 and 4).	Fill to capacity		Cool all samples to 4°C (±2°C) immediately after collection.	14 days
Pesticides/ Aroclors	Water	At least two 1 L amber glass bottles, fitted with screw-caps lined with PTFE (see Table 2-2, Reference Number 5).	2 L	If amber containers are not available, the samples should be protected from the light.	Cool all samples to 4°C (±2°C) immediately after collection. DO NOT FREEZE water samples.	7 days
	Soil/Sediment	Use one 8 oz wide-mouth glass jar or two 4 oz wide-mouth glass jars (see Table 2-2, Reference Numbers 3 and 4).	Fill to capacity		Cool all samples to 4°C (±2°C) immediately after collection.	14 days

[1]This technical holding time is calculated from the time of sample collection to sample extraction. Sample extracts are to be analyzed within 40 days of extraction. It is recommended that samplers ship samples to the laboratory on the same day that they are collected, or as soon as possible thereafter.

[2]Check Regional guidance regarding use of acid preservatives when testing for carbonates, residual chlorine, and other oxidants.

[3]When sampling for VOAs in soil using the CLP options of SW-846 Method 5035A, samplers should use the requirements that are provided in Appendix B.

Table 3-3. Inorganic Sample Collection Parameters (SOW ILM05.3)

Target Analyte/Method	Matrix	Containers	Volume/ Mass	Important Notes	Preservative	Technical Holding Time[1]
Metals/Inductively Coupled Plasma-Atomic Emission Spectroscopy (ICP-AES) and/or Mercury by Cold Vapor Atomic Absorption (CVAA)	Water	Use one 1 L high density polyethylene glass bottle (see Table 2-2, Reference Number 2).	1 L	If collecting for both ICP-AES **AND** ICP-MS methods, a separate 1 L volume of sample must be collected for each method per sample location.	Acidify to pH <2 with HNO_3 and cool to 4°C (±2°C) immediately after collection.[2] DO NOT FREEZE water samples.	6 months for all metals except Mercury (28 days)
	Soil/ Sediment	Use one 8 oz wide-mouth glass jar (see Table 2-2, Reference Number 3).	Fill to capacity		Cool to 4°C (±2°C) immediately after collection.	6 months
Metals/Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) and/or Mercury by CVAA	Water	Use one 1 L high density polyethylene glass bottle (see Table 2-2, Reference Number 2).	1 L	If collecting for both ICP-AES **AND** ICP-MS methods, a separate 1 L volume of sample must be collected for each method per sample location.	Acidify to pH <2 with HNO_3 and cool to 4°C (±2°C) immediately after collection.[2] DO NOT FREEZE water samples.	6 months for all metals except Mercury (28 days)
Cyanide/Spectro-photometric Determination[3]	Water	Use one 1 L high density polyethylene glass bottle (see Table 2-2, Reference Number 2).	1 L		To neutralize residual chlorine, immediately upon collection, add 0.6 g ascorbic acid for each liter of sample collected. Add NaOH until pH >12 and cool to 4°C (±2°C) immediately after collection. DO NOT FREEZE water samples.	14 days
	Soil/ Sediment	Use one 8 oz wide-mouth glass jar (see Table 2-2, Reference Number 3).	Fill to capacity		Cool to 4°C (±2°C) immediately after collection.	14 days

[1]The technical holding time is calculated from the time of sample collection. It is recommended that samplers ship samples to the laboratory the same day that they are collected, or as soon as possible thereafter.

[2]For the analysis of dissolved metals, the sampler is required to filter the sample through a membrane filter (such as a 0.45 micron pore diameter membrane filter) at the time of collection or as soon as possible thereafter. Use a portion of the sample to rinse the filter flask, discard this portion, and collect the required volume of filtrate. Then preserve as described above.

[3]Samplers must test for sulfide and oxidizing agents (e.g., chlorine) in aqueous samples in the field upon collection. Please refer to the SAP and Appendix C for guidance. Sulfides adversely affect the analytical procedure. The following can be done to test for and neutralize sulfides. Place a drop of the sample on lead acetate test paper to detect the presence of sulfides. If sulfides are present, treat 25 mL more of the sample than that required for the cyanide determination with powdered cadmium carbonate or lead carbonate. Yellow cadmium sulfide or black lead sulfide precipitates if the sample contains sulfide. Repeat this operation until a drop of the treated sample solution does not darken the lead acetate test paper. Filter the solution through a dry filter paper into a dry beaker, and from the filtrate measure the sample to be used for analysis. Avoid a large excess of cadmium carbonate and a long contact time in order to minimize a loss by complexation or occlusion of cyanide on the precipitated material. Sulfide removal should be performed in the field, if practical, prior to pH adjustment with NaOH.

3.2 Complete Required Documentation

The documentation that sampling personnel must complete is the recording of the CLP Sample Number and the SMO-assigned Case Number on the sample container or bottle, the use of sample tags, sample labels, and chain-of-custody seals (as appropriate), the completion of the Traffic Report/Chain of Custody (TR/COC) Record, and the completion of field operations records (as necessary).

Samplers should use the Field Operations Records Management System Lite (FORMS II Lite) software to create and print sample labels and the TR/COC Record. Samplers can create and print out two copies of a sample label and attach one to the sample container or bottle, and place the other on the sample tag that is to be attached to the sample container or bottle.

Sampling personnel are expected to review their project plans to determine what documentation they are expected to include during a sampling event. It is highly recommended that sampling personnel use this documentation, even if the Region does not require it.

Note: Under no circumstances should the site name appear on any documentation being sent to the laboratory.

An example of a packaged sample is shown in Figure 3-1. A description of each type of documentation and instructions for accurately completing them are included in the following sections.

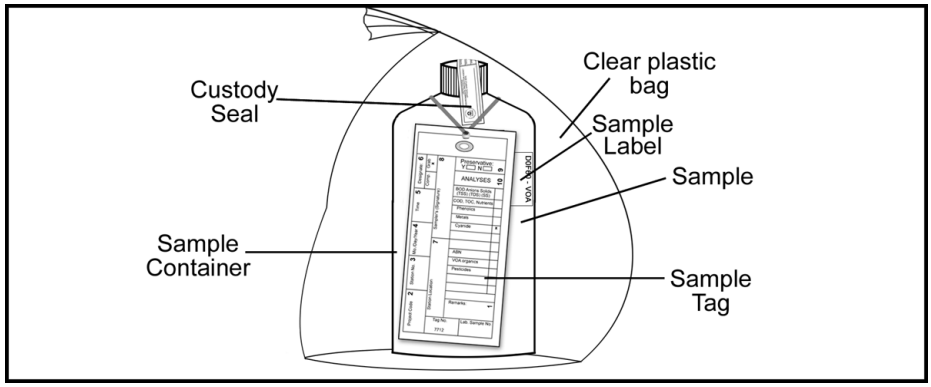


Figure 3-1. Packaged Sample with Identification and Chain-of-Custody Documentation (Excluding TR/COC Record) Attached

3.2.1 Identify a Sample with a CLP Sample Number and SMO-assigned Case Number

The CLP Sample Number and SMO-assigned Case Number **must** be recorded on each sample taken during a sampling event (see Section 1.4.1.1). Sampling personnel can record these numbers on the sample bottle or container using permanent ink. The numbers must also be recorded on the sample tag.

Note: Dissolved metal samples and total metal samples taken from the same sampling location cannot have the same CLP Sample Number because two different sets of data will be generated for evaluation purposes.

3.2.2 Complete Traffic Report/Chain of Custody (TR/COC) Records

A TR/COC Record is used as physical evidence of sample custody and as a permanent record for each sample collected. A chain-of-custody record documents the exchange and transportation of samples from the field to the laboratory. The Analytical Services Branch (ASB) requires samplers to use the FORMS II Lite software to create documentation for all CLP sampling efforts. For assistance with obtaining or using the FORMS II Lite software, please contact the FORMS II Lite Help Desk at 703-818-4200 from 9:00 AM - 5:00 PM ET.

To meet CLP sample documentation and chain-of-custody requirements, the sampler must attach a separate TR/COC Record to each cooler they ship. The TR/COC Record must document each sample within the cooler. Samples shipped in other coolers should not be documented. This practice maintains the chain-of-custody for all samples in case of incorrect shipment.

It is critical that each CLP sample have a unique CLP Sample Number and SMO-assigned Case Number, therefore samplers must avoid errors such as:

- Failure to use CLP Sample Numbers or SMO-assigned Case Numbers;
- Incorrect use of CLP Sample Numbers or SMO-assigned Case Numbers (e.g., duplication); and
- Water and soil samples sent under the same CLP Sample Number.

If more than one TR/COC Record is used for the samples within one cooler, all of the records must have complete header information and original signatures. Sampling personnel are responsible for the care and custody of samples from the time of collection to the time of shipment to the laboratories for analysis. A sample is considered under custody if:

- It is in possession or in view after being in possession;
- It was in possession and then locked up or sealed to prevent tampering; or
- It was in possession when placed in a secured area.

Each time the custody of samples is turned over to another person, the TR/COC Record must be signed off by the former custodian and accepted by the new custodian. Sampling personnel are, therefore, responsible for properly completing any forms or other Region-required documentation used to establish the chain-of-custody for each sample during a sampling event.

3.2.2.1 Completing a Traffic Report/Chain of Custody (TR/COC) Record Using the FORMS II Lite Software

A sampler will input sample collection information into FORMS II Lite and a TR/COC Record will be generated electronically. The software will automatically allocate space on the form only to the fields used by the sampler. This feature of the software re-allocates on an as-needed basis, displaying only the information input by the sampler when the TR/COC Record is printed. The FORMS II Lite software will generate a laboratory and a Regional copy of the TR/COC Record (see Figures 3-2 through 3-5). The sampler can print out multiple copies of the TR/COC

Record as necessary. The sampler must sign and submit original copies of the TR/COC Record as appropriate.

An electronic TR/COC Record created using the FORMS II Lite software contains basic header information; however, the sampler can also include some additional detailed information. For example, not only is the sample matrix listed on the electronic TR/COC Record, but the name of the sampler taking the sample can also be entered. The appearance of more space on the electronic TR/COC Record is a result of the space re-allocation on an as-needed basis. Samplers should note that certain guidance information will not appear on the electronic TR/COC Record (e.g., matrix and preservative descriptions).

3.2.2.2 Indicating Method Flexibility on FORMS II Lite TR/COC Records

When completing a TR/COC Record using FORMS II Lite, the sampler should identify any samples that will be analyzed using a CLP-modified analysis (i.e., Method Flexibility Clause). Samplers should indicate use of a modified analysis by inputting the name of the analysis and its associated abbreviation code. To do this, a new analysis must be created within the FORMS II Lite Wizard or through the FORMS II Lite Reference Tables. This newly-created analysis should contain the Modification Reference Number within the name assigned to the flexibility clause. For example, if a Region submits a modified analysis for an additional analyte, and CLP SMO assigns the Modification Reference Number as "R9092203", the FORMS II Lite analysis could be named as "VOA by M.A. R9092203". The associated abbreviation for this analysis would be "VOA M.A.". If you have any questions regarding identification of method flexibility using FORMS II Lite, please contact the FORMS II Lite Help Desk at 703-818-4200 from 9:00 AM - 5:00 PM ET.

3.2.2.3 Making Manual Edits to Printed FORMS II Lite TR/COC Records

If FORMS II Lite TR/COC Record has been printed and deletions or edits need to be made by the sampler, the following procedures must be followed:

- **If a making a deletion,** cross out the information to be deleted from the TR/COC Record and initial and date the deletion.

- **If making an addition,** enter the new information and sign and date the newly added information.

Note: All modifications made on a printed TR/COC Record must be initialed and dated.

Figure 3-2. An Organic TR/COC Record Created Using the FORMS II Lite Software (Laboratory Copy)

EPA **USEPA Contract Laboratory Program**
Organic Traffic Report & Chain of Custody Record

Case No: 99999
DAS No:
SDG No: L

Date Shipped: 04/09/2001
Carrier Name: FedEx
Airbill: 41033427144
Shipped to: Organic Lab
999 Route 120
Arlington VA 22044
(999) 555-5555

Chain of Custody Record

Sampler Signature:

Relinquished By	(Date / Time)	Received By	(Date / Time)
1			
2			
3			
4			

For Lab Use Only
Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

ORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE	STATION LOCATION	SAMPLE COLLECT DATE/TIME	INORGANIC SAMPLE No.	FOR LAB USE ONLY Sample Condition On Receipt
C0100	Surface Soil (0"-6")/ DAN SAMPLER, BOB SAMPLER	/G	Arochlors (7)	31 (Ice Only) (1)	1	S: 04/09/2001 11:05		
C0101	Surface Soil (0"-6")/ DAN SAMPLER	/G	Arochlors (7)	32 (Ice Only) (1)	2	S: 04/09/2001 11:20		
C0102	Surface Soil (0"-6")/ DAN SAMPLER, BOB SAMPLER	/G	Arochlors (7)	33 (Ice Only) (1)	3	S: 04/09/2001 11:30		
C0103	Sediment/ DAN SAMPLER, BOB SAMPLER	/G	Arochlors (7)	34 (Ice Only) (1)	4	S: 04/09/2001 11:45		
C0104	Sediment/ DAN SAMPLER	/G	Arochlors (7)	36 (Ice Only) (1)	5	S: 04/09/2001 11:55		
C0107	Surface Water/ DAN SAMPLER	/G	Arochlors (7)	3133 (Ice Only), 3134 (Ice Only) (2)	1	S: 04/09/2001 10:52 E: 04/09/2001 10:54		
C0108	Sediment/ JOE SAMPLER	/G	Arochlors (7)	3135 (Ice Only) (1)	3	S: 04/09/2001 10:51		

Shipment for Case Complete? N	Sample(s) to be used for laboratory QC: C0109	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt:	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G		Custody Seal Intact?___ Shipment Iced?___

Arochlors = Arochlors, BNA = TCL Semivolatiles, VOA = TCL Volatiles

TR Number: 3-235781339-040901-0002

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
Send Copy to: Contract Laboratory Analytical Services Support, 2000 Edmund Halley Dr., Reston, VA. 20191-3436 Phone 703/264-9348 Fax 703/264-9222

LABORATORY COPY

F2V5.0.66 Page 1 of 3

Figure 3-3. An Inorganic TR/COC Record Created Using the FORMS II Lite Software (Laboratory Copy)

EPA **USEPA Contract Laboratory Program**
Inorganic Traffic Report & Chain of Custody Record

Case No: 99999
DAS No:
SDG No: L

Date Shipped: 04/09/2001
Carrier Name: FedEx
Airbill: 41033427133
Shipped to: Inorganic Lab
555 Clp Street
CLP VA 22044
(703) 555-5555

Chain of Custody Record

Relinquished By	(Date / Time)	Received By	(Date / Time)
1			
2			
3			
4			

Sampler Signature:

For Lab Use Only
Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE	STATION LOCATION		SAMPLE COLLECT DATE/TIME	ORGANIC SAMPLE No.	FOR LAB USE ONLY Sample Condition On Receipt
MC0103	Sediment/ DAN SAMPLER, BOB SAMPLER	/G	TM (7)	35 (Ice Only) (1)	4	S:	04/09/2001 11:45		
MC0104	Sediment/ DAN SAMPLER	/G	TM (7)	37 (Ice Only) (1)	5	S:	04/09/2001 11:55		
MC0106	Sediment/ DAN SAMPLER	/G	TM (7)	311 (Ice Only) (1)	3	S:	04/09/2001 9:52		
MC0107	Surface Water/ DAN SAMPLER	/G	TM (7)	312 (HNO3, Ice) (1)	1	S: E:	04/09/2001 10:52 04/09/2001 10:54		
MC0108	Sediment/ JOE SAMPLER	/G	TM (7)	313 (Ice Only) (1)	3	S:	04/09/2001 10:51		
MC0109	Surface Water/ JOHN SAMPLER	/G	TM (7)	329 (HNO3, Ice), 330 (HNO3, Ice), 331 (HNO3, Ice) (3)	14	S:	04/09/2001 13:00		
MC0110	Surface Soil (0"-6")/ BOBBY SAMPLER	/G	TM (7)	335 (Ice Only) (1)	16	S:	04/09/2001 13:00		
MC0111	Surface Water/ JOE SAMPLER	/G	TM (7)	342 (HNO3, Ice) (1)	15	S:	04/09/2001 14:00		
MC0112	Sediment/ JOHN SAMPLER	/G	TM (7)	346 (Ice Only) (1)	17	S:	04/09/2001 14:00		

Shipment for Case Complete? N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt:	Chain of Custody Seal Number:	
Analysis Key: TM = TAL Total Metals	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G		Custody Seal Intact?__	Shipment Iced?__

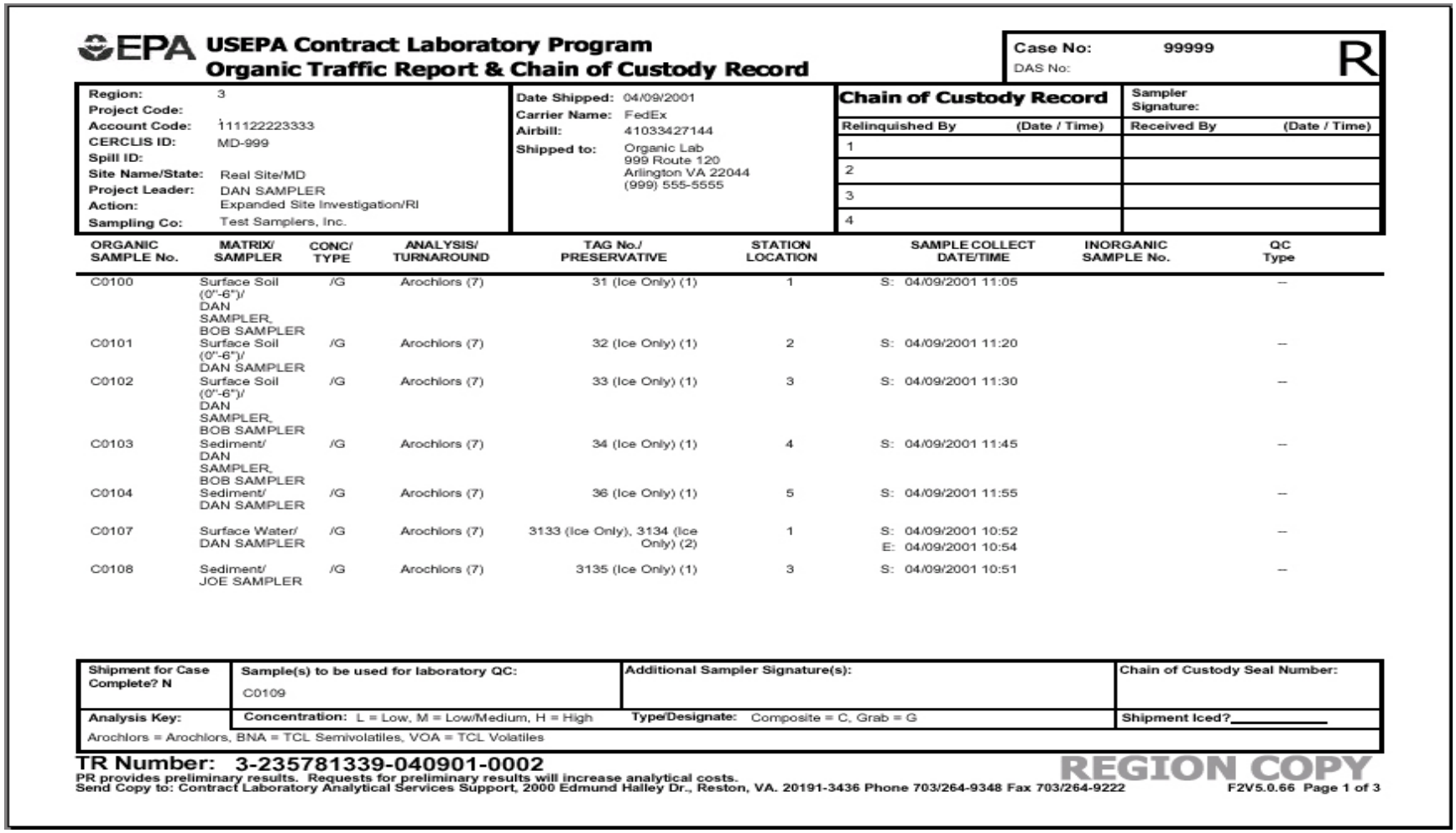
TR Number: 3-235781339-040901-0001

LABORATORY COPY

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
Send Copy to: Contract Laboratory Analytical Services Support, 2000 Edmund Halley Dr., Reston, VA. 20191-3436 Phone 703/264-9348 Fax 703/264-9222

F2V5.0.66 Page 1 of 2

Figure 3-4. An Organic TR/COC Record Created Using the FORMS II Lite Software (Regional Copy)



EPA **USEPA Contract Laboratory Program**
Organic Traffic Report & Chain of Custody Record

Case No: 99999
DAS No:
R

Region:	3	**Date Shipped:**	04/09/2001
Project Code:		**Carrier Name:**	FedEx
Account Code:	111122223333	**Airbill:**	41033427144
CERCLIS ID:	MD-999	**Shipped to:**	Organic Lab 999 Route 120 Arlington VA 22044 (999) 555-5555
Spill ID:			
Site Name/State:	Real Site/MD		
Project Leader:	DAN SAMPLER		
Action:	Expanded Site Investigation/RI		
Sampling Co:	Test Samplers, Inc.		

Chain of Custody Record

Relinquished By	(Date / Time)	Received By	(Date / Time)
1			
2			
3			
4			

Sampler Signature:

ORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE	STATION LOCATION	SAMPLE COLLECT DATE/TIME	INORGANIC SAMPLE No.	QC Type
C0100	Surface Soil (0"-6")/ DAN SAMPLER, BOB SAMPLER	/G	Arochlors (7)	31 (Ice Only) (1)	1	S: 04/09/2001 11:05		--
C0101	Surface Soil (0"-6")/ DAN SAMPLER	/G	Arochlors (7)	32 (Ice Only) (1)	2	S: 04/09/2001 11:20		--
C0102	Surface Soil (0"-6")/ DAN SAMPLER, BOB SAMPLER	/G	Arochlors (7)	33 (Ice Only) (1)	3	S: 04/09/2001 11:30		--
C0103	Sediment/ DAN SAMPLER, BOB SAMPLER	/G	Arochlors (7)	34 (Ice Only) (1)	4	S: 04/09/2001 11:45		--
C0104	Sediment/ DAN SAMPLER	/G	Arochlors (7)	36 (Ice Only) (1)	5	S: 04/09/2001 11:55		--
C0107	Surface Water/ DAN SAMPLER	/G	Arochlors (7)	3133 (Ice Only), 3134 (Ice Only) (2)	1	S: 04/09/2001 10:52 E: 04/09/2001 10:54		--
C0108	Sediment/ JOE SAMPLER	/G	Arochlors (7)	3135 (Ice Only) (1)	3	S: 04/09/2001 10:51		--

Shipment for Case Complete? N	**Sample(s) to be used for laboratory QC:** C0109	**Additional Sampler Signature(s):**	**Chain of Custody Seal Number:**
Analysis Key:	**Concentration:** L = Low, M = Low/Medium, H = High	**Type/Designate:** Composite = C, Grab = G	**Shipment Iced?**_____
Arochlors = Arochlors, BNA = TCL Semivolatiles, VOA = TCL Volatiles			

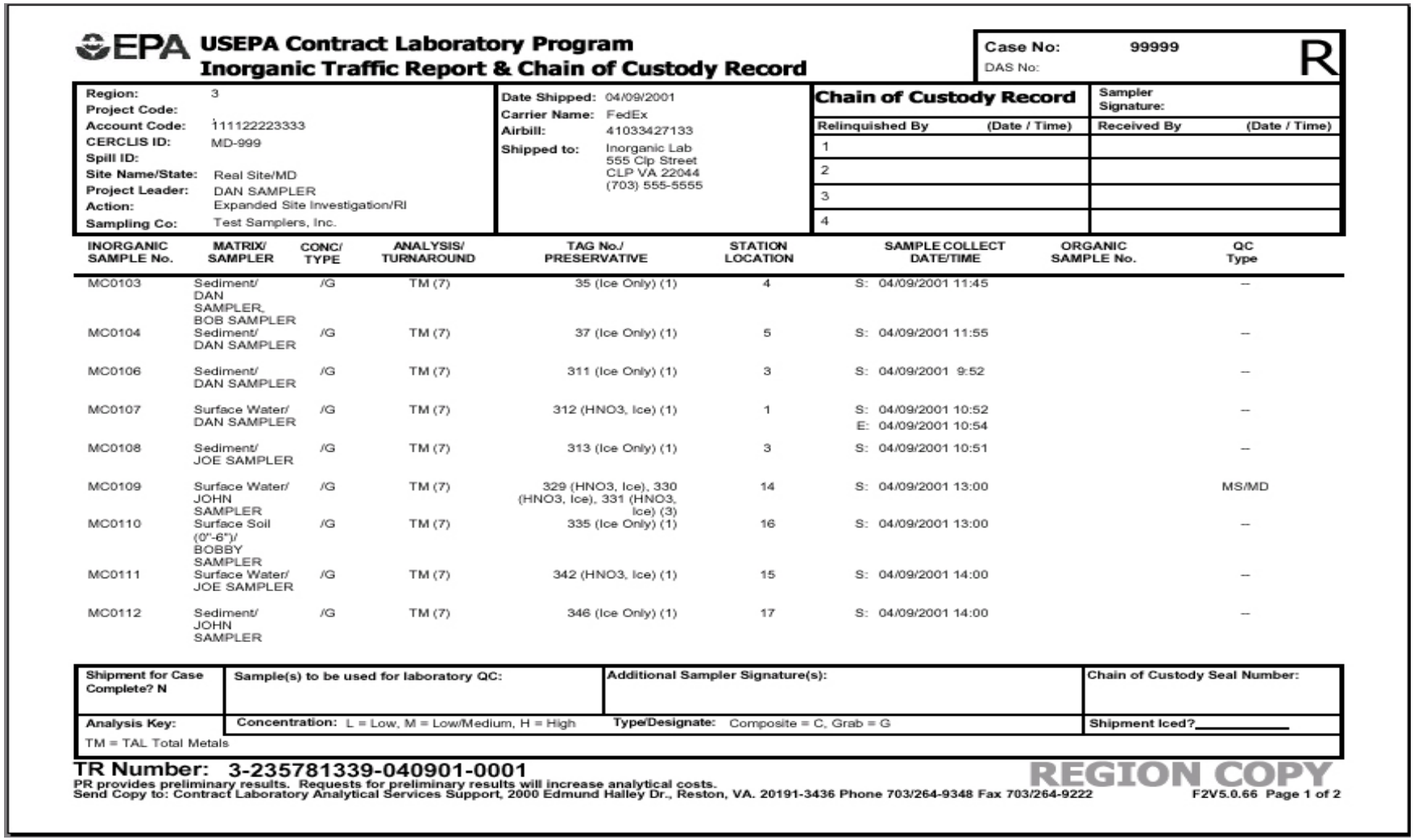
TR Number: 3-235781339-040901-0002

REGION COPY

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
Send Copy to: Contract Laboratory Analytical Services Support, 2000 Edmund Halley Dr., Reston, VA. 20191-3436 Phone 703/264-9348 Fax 703/264-9222

F2V5.0.66 Page 1 of 3

Figure 3-5. An Inorganic TR/COC Record Created Using the FORMS II Lite Software (Regional Copy)



EPA **USEPA Contract Laboratory Program**
Inorganic Traffic Report & Chain of Custody Record

Case No: 99999
DAS No:
R

Region:	3	**Date Shipped:**	04/09/2001	**Chain of Custody Record**	**Sampler Signature:**
Project Code:		**Carrier Name:**	FedEx	**Relinquished By (Date / Time)**	**Received By (Date / Time)**
Account Code:	111122223333	**Airbill:**	41033427133	1	
CERCLIS ID:	MD-999	**Shipped to:**	Inorganic Lab 555 Clp Street CLP VA 22044 (703) 555-5555	2	
Spill ID:				3	
Site Name/State:	Real Site/MD			4	
Project Leader:	DAN SAMPLER				
Action:	Expanded Site Investigation/RI				
Sampling Co:	Test Samplers, Inc.				

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE	STATION LOCATION	SAMPLE COLLECT DATE/TIME	ORGANIC SAMPLE No.	QC Type
MC0103	Sediment/ DAN SAMPLER, BOB SAMPLER	/G	TM (7)	35 (Ice Only) (1)	4	S: 04/09/2001 11:45		--
MC0104	Sediment/ DAN SAMPLER	/G	TM (7)	37 (Ice Only) (1)	5	S: 04/09/2001 11:55		--
MC0106	Sediment/ DAN SAMPLER	/G	TM (7)	311 (Ice Only) (1)	3	S: 04/09/2001 9:52		--
MC0107	Surface Water/ DAN SAMPLER	/G	TM (7)	312 (HNO3, Ice) (1)	1	S: 04/09/2001 10:52 E: 04/09/2001 10:54		--
MC0108	Sediment/ JOE SAMPLER	/G	TM (7)	313 (Ice Only) (1)	3	S: 04/09/2001 10:51		--
MC0109	Surface Water/ JOHN SAMPLER	/G	TM (7)	329 (HNO3, Ice), 330 (HNO3, Ice), 331 (HNO3, Ice) (3)	14	S: 04/09/2001 13:00		MS/MD
MC0110	Surface Soil (0"-6")/ BOBBY SAMPLER	/G	TM (7)	335 (Ice Only) (1)	16	S: 04/09/2001 13:00		--
MC0111	Surface Water/ JOE SAMPLER	/G	TM (7)	342 (HNO3, Ice) (1)	15	S: 04/09/2001 14:00		--
MC0112	Sediment/ JOHN SAMPLER	/G	TM (7)	346 (Ice Only) (1)	17	S: 04/09/2001 14:00		--

Shipment for Case Complete? N	**Sample(s) to be used for laboratory QC:**	**Additional Sampler Signature(s):**	**Chain of Custody Seal Number:**
Analysis Key:	**Concentration:** L = Low, M = Low/Medium, H = High	**Type/Designate:** Composite = C, Grab = G	**Shipment Iced?**_____
TM = TAL Total Metals			

TR Number: 3-235781339-040901-0001

REGION COPY

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
Send Copy to: Contract Laboratory Analytical Services Support, 2000 Edmund Halley Dr., Reston, VA. 20191-3436 Phone 703/264-9348 Fax 703/264-9222

F2V5.0.66 Page 1 of 2

3.2.3 Complete and Attach Custody Seals

Custody seals are usually pre-printed stickers that are signed (or initialed) and dated by the sampler after collection and placed on sample bottles or containers and/or shipping coolers or containers. The custody seals document who sealed the sample container and verify that the sample has not been tampered with. The seals must be placed such that they will break if the sample bottle or container or the shipping cooler or container is tampered with or opened after leaving custody of sampling personnel (see Figure 3-6). Custody seals can also be used to maintain custody of other items such as envelopes containing videotapes of the sample collection process.

Note: Custody seals should never be placed directly onto a coring tool used as a transport device (e.g., 5 g Sampler) or tared, 40 mL closed-system vials. The seals must be placed on the bag for the coring tool used as a transport device, or on the bag used to enclose the vials. Refer to Appendix B for details.

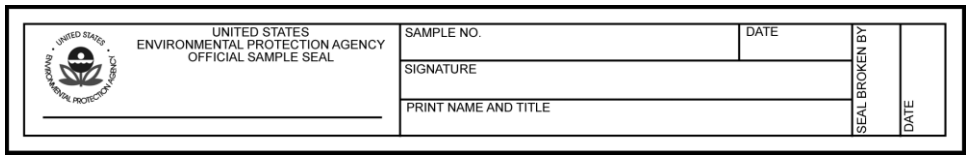


Figure 3-6. Custody Seal

Instructions for completing and attaching a custody seal are included in Table 3-4.

Table 3-4. Completing and Attaching a Custody Seal

Step	Action	Important Notes
1	Record the CLP Sample Number.	The space for the CLP Sample Number does not need to be completed on custody seals being placed on the opening of a cooler, only on those being placed on the opening of sample bottles or containers.
2	Record the SMO-assigned Case Number.	
3	Record the month, day, and year of sample collection.	
3	Sign the seal in the Signature area.	
4	Print your name and title in the Print Name and Title area.	
5	Place the custody seal over the edge of the sample bottle or container such that it will break if tampered with.	Custody seals can be placed directly on any sample container except for coring tools used as a transport device (e.g., 5 g Samplers) and tared VOA bottles. If packing coring tools used as a transport device or tared VOA bottles, place them in a clear plastic bag and place the custody seal on the outside of the bag.
6	If possible, cover the custody seal with clear plastic tape to protect it.	Take special care to not place the protective tape over the seal in such a way that it can be removed and then re-attached without signs of tampering.

The use and type of custody seals can vary by Region or collecting organization. Sampling personnel should obtain the appropriate custody seals and specific instructions for correctly attaching them from the RSCC Coordinator.

3.2.4 Complete and Attach Sample Labels

It is recommended that samplers affix sample labels to each sample container. A sample label must contain the associated CLP Sample Number (either written or pre-printed), SMO-assigned Case Number, and the preservative used. It must also denote the analysis/fraction. Samplers may also include additional information such as the station location or the date/time of collection. Per CLP documentation requirements, the CLP Sample Number and SMO-assigned Case Number must appear on a sample label or be legibly printed on the sample. Samplers should use FORMS II Lite to create and print sample labels. The sampler can print two labels and attach one to the sample container or bottle, and place the other label on the sample tag that should also be attached to the sample container or bottle. Both labels should then be covered with clear packaging tape to protect the label and maintain legibility. If handwriting a sample label, the sampler should complete the label information using waterproof ink, place the label on the outside of the sample bottle or container, then cover the label with clear packaging tape to protect the label and maintain legibility (see Figure 3-1).

Note: Do not attach labels to tared VOA sample vials. A label should already be pre-attached to the tared vial.

3.2.5 Complete and Attach Sample Tags

To support use of sample data in potential enforcement actions, sample characteristics other than *in situ* measurements (e.g., pH, temperature, conductivity) can be identified with a sample tag. Typically, site-specific information is written on the tags using waterproof ink. The use and type of sample tags may vary by Region. For each sampling event, sampling personnel should receive the required sample tags and type of information to include from the Region/RSCC Coordinator. Per CLP documentation requirements, the sampler must record the CLP Sample Number and SMO-assigned Case Number on a sample tag. The sampler can use FORMS II Lite to create and print out multiple sample labels, one of which can be attached to the sample tag and then covered with clear packaging tape to protect the label and maintain legibility. If FORMS II Lite-created sample labels are not available, a detailed set of instructions for completing and attaching a handwritten sample tag are included in Table 3-5.

Note: The use and type of sample tags may vary among Regions.

Table 3-5. Completing and Attaching a Handwritten Sample Tag

Step	Action	Important Notes
1	Under the "Remarks" heading, record the CLP Sample Number and SMO-assigned Case Number.	Make sure to record the correct CLP Sample Number and SMO-assigned Case Number in a legible manner.
2	Record the project code (e.g., Contract Number, Work Assignment Number, Interagency Agreement Number, etc.) assigned by USEPA.	
3	Enter the station number assigned by the sampling team coordinator.	
4	Record the month, day, and year of sample collection.	
5	Enter the military time of sample collection (e.g., 13:01 for 1:01 PM).	
6	Place an "X" in the box next to Yes or No to indicate if a preservative was added to the sample.	
7	Under "Analyses", place an "X" in the box next to the parameters for which the sample is to be analyzed.	
8	Leave the box for "Laboratory Sample Number" blank.	
9	It is recommended that the sample tag be attached to the neck of the sample bottle or container using regular string, stretch string, or wire (see Figure 3-1).	Do **NOT** use wire to attach a sample tag to a metals sample.

An example of a completed sample tag is included in Figure 3-7 below:

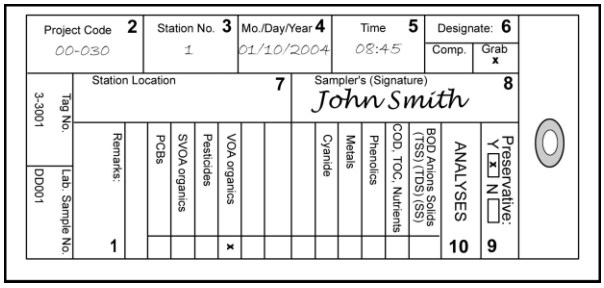
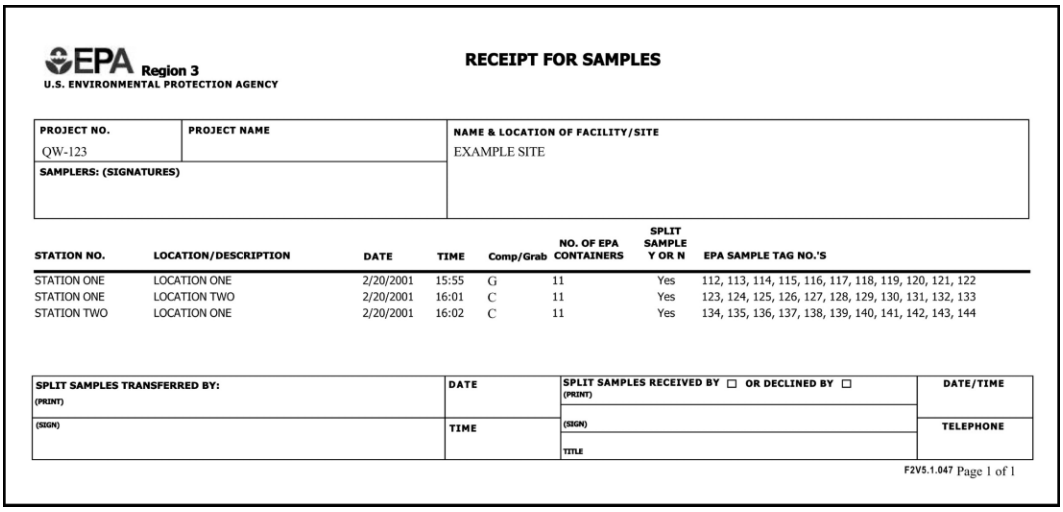


Figure 3-7. Completed Sample Tag

3.3 Provide Sample Receipt

After samples have been taken, the sampler should prepare a receipt for these samples and provide this receipt to the property owner. This is especially important when sampling on private property since these samples could be used during future ligation and the receipt will verify that the owner granted approval for the removal of the samples from the property. An example of a sample receipt created using FORMS II Lite is show in Figure 3-8.



EPA Region 3
U.S. ENVIRONMENTAL PROTECTION AGENCY

RECEIPT FOR SAMPLES

PROJECT NO.	PROJECT NAME	NAME & LOCATION OF FACILITY/SITE
QW-123		EXAMPLE SITE
SAMPLERS: (SIGNATURES)		

STATION NO.	LOCATION/DESCRIPTION	DATE	TIME	Comp/Grab	NO. OF EPA CONTAINERS	SPLIT SAMPLE Y OR N	EPA SAMPLE TAG NO.'S
STATION ONE	LOCATION ONE	2/20/2001	15:55	G	11	Yes	112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122
STATION ONE	LOCATION TWO	2/20/2001	16:01	C	11	Yes	123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133
STATION TWO	LOCATION ONE	2/20/2001	16:02	C	11	Yes	134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144

SPLIT SAMPLES TRANSFERRED BY: (PRINT)	DATE	SPLIT SAMPLES RECEIVED BY ☐ OR DECLINED BY ☐ (PRINT)	DATE/TIME
(SIGN)	TIME	(SIGN)	TELEPHONE
		TITLE	

F2V5.1.047 Page 1 of 1

Figure 3-8. Sample Receipt Created Using the FORMS II Lite Software

3.4 Pack and Ship Samples

Once the samples have been taken, it is very important that the sampler properly package the samples for shipment and ensure that the samples are sent to the appropriate laboratory as quickly as possible. Prompt and proper packaging of samples will:

- Meet acceptance or performance criteria (i.e., acceptance or performance criteria such as detection limits) by collecting sufficient sample volumes for each method;
- Protect the integrity of samples from changes in composition or concentration caused by bacterial growth or degradation from increased temperatures;
- Reduce the chance of leaking or breaking of sample containers that would result in loss of sample volume, loss of sample integrity, and exposure of personnel to toxic substances; and
- Help ensure compliance with shipping regulations.

3.4.1 Sample Containers

Once samples are collected, they must be stored in conditions that maintain sample integrity. All samples should be placed in shipping containers or other suitable containers with ice to reduce the temperature as soon as possible after collection. Ideally, all samples should be shipped the day of collection for overnight delivery to the laboratory. If samples cannot be shipped on the day of collection, the sample temperature should be maintained at 4°C (±2°C) until they are shipped to the laboratory.

One CLP RAS sample may be contained in several bottles and vials. For example, under the CLP SOW OLC03.2, one water sample might consist of all containers needed for the three analytical fractions available under this service (i.e., VOA fraction, SVOA fraction, and Pesticide/Aroclor fraction), even though the fractions will be collected in separate containers. Therefore, the analysis to be performed and the matrix type will determine the type of container that will be used, as well as the volume that must be collected for that particular sample fraction.

3.4.2 Inventory of Samples and Documentation

Prior to shipment, sampling personnel should conduct an inventory of the contents of the shipping cooler or container against the corresponding TR/COC Record when packing for shipment to laboratories. An inventory will ensure that the proper number of containers have been collected for each analysis of the samples, that the required PE and QC samples and cooler temperature blanks are included, and the correct Sample Numbers and fractions have been assigned to each sample.

3.4.3 Follow Shipping Regulations

Sample shipping personnel are legally responsible for ensuring that the sample shipment will comply with all applicable shipping regulations. For example, hazardous material samples must be packaged, labeled, and shipped in compliance with all International Air Transport Association (IATA) Dangerous Goods regulations or DOT regulations and USEPA guidelines. Refer to Appendix B for detailed shipping guidelines when using SW-846 Method 5035A to preserve and ship samples.

3.4.4 Package Samples for Shipment

Sampling personnel are responsible for the proper packaging of samples for shipment. To ensure that samples are appropriately packaged (e.g., to avoid breakage and/or contamination) the sampler should consult their respective project plans to determine the proper packing and shipping procedures. The sampler must determine the sample type, pack the shipping containers correctly, include necessary paperwork, label and seal shipping containers or coolers, and ship the samples.

3.4.4.1 Determine the Sample Type and Container

Sampling personnel should know what kinds of samples they are handling to ensure proper packaging. Samplers should refer to their appropriate project plans to determine which type of sample container should be used for each type of sample being taken during the sampling event.

Note: Please follow Regional guidance with reference to samples containing dioxin or radioactive waste. The CLP cannot accept any radioactive waste samples for analysis.

3.4.4.2 Pack Shipping Containers

It is imperative that samples are correctly and carefully packed in shipping containers to prevent the sample containers from breaking or leaking. Samplers must prepare and pack a shipping cooler or container according to the instructions outlined in Table 3-6.

Table 3-6. Packing Samples for Shipment

Step	Action	Important Notes
1	Seal all drain holes, both inside and out, to prevent leakage in the event of sample breakage.	
2	Check all lids/caps to make sure they are tightly sealed and will not leak.	
3	Seal samples within a clear plastic bag.	Custody seals can be placed directly on any sample container except for coring tools used as a transport device (e.g., 5 g Samplers) and tared VOA bottles. If packing coring tools used as a transport device or tared VOA bottles, place them in a clear plastic bag and place the custody seal on the outside of the bag.
4	Fully chill samples to 4°C (±2°C) prior to placement within suitable packing materials.	
5	Prior to placing samples within the shipping cooler, it is recommended that samplers line shipping containers with non-combustible, absorbent packing material such as rock wool, ground corn cobs, perlite, or clay-based absorbents (e.g., kitty litter or 'oil dry').	
6	Place samples in CLEAN, sealed, watertight shipping containers (metal or hard plastic cooler).	
7	Conduct an inventory of the contents of the shipping cooler/container against the corresponding TR/COC Record.	
8	Cover samples in double-bagged ice to prevent water damage to packing materials.	Do NOT pour loose ice directly into the sample cooler. The ice will maintain the temperature of the samples within the shipping cooler.
9	**It is recommended that samplers include a temperature blank within each cooler being shipped.**	**The temperature blank is generally a 40 mL vial filled with water and labeled "temperature blank".**
10	**Ensure that the site name or other site-identifying information does not appear on any documentation being sent to the laboratory.**	**The laboratory cannot receive any site-identifying information.**

3.4.4.3 Include Necessary Paperwork

Sampling personnel must properly place the necessary paperwork in the shipping cooler. All paperwork must be placed in a plastic bag or pouch and then secured to the underside of the shipping cooler lids (see Figure 3-9).

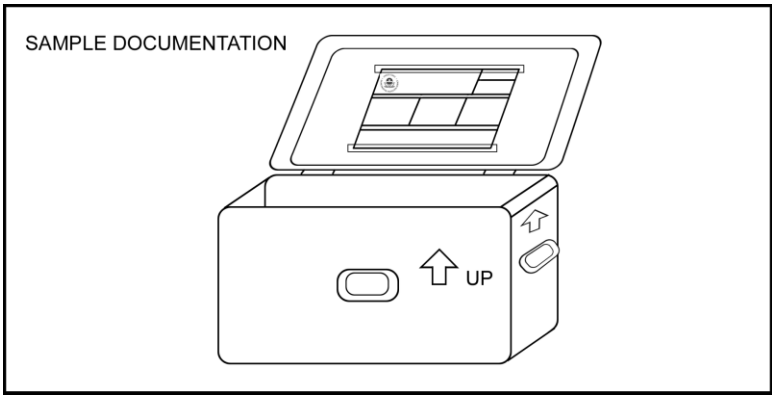


Figure 3-9. Sample Cooler with Attached TR/COC Record and Cooler Return Documentation

Necessary paperwork includes TR/COC Records and sample weight logs (see Figure 3-10), if required (for VOA samples). Sampling personnel should contact their RSCC or their designee for specific paperwork requirements.

USEPA Contract Laboratory Program
Sample Weight Log

Shipped to: AAA Testing Laboratory
1700 Mill Avenue
Houston TX 77099
(281) 983-1234

Case No. 39563
DAS No. DAS34
Date Shipped: 9/29/2003

Sample No.	Matrix	Analysis	Preservative	Bottle/ Tag Number	Tared Weight (g)	Final Weight (g)	Sample Weight (g)	Laboratory Weight	Traffic Report No.
C0036	Subsurface Soil (>12")	CLP TCL Volatiles	Ice Only	199548	32.80	37.20	4.40		3-103018225-092903-0001
C0036	Subsurface Soil (>12")	CLP TCL Volatiles	Ice Only	199547	32.10	38.30	6.20		3-103018225-092903-0001
C0036	Subsurface Soil (>12")	CLP TCL Volatiles	Ice Only	199549	31.20	38.60	7.40		3-103018225-092903-0001
C0037	Surface Soil (0"-12")	CLP TCL Volatiles	Ice Only	199552	32.00	36.90	4.90		3-103018225-092903-0001
C0037	Surface Soil (0"-12")	CLP TCL Volatiles	Ice Only	199551	32.40	37.10	4.70		3-103018225-092903-0001
C0037	Surface Soil (0"-12")	CLP TCL Volatiles	Ice Only	199550	31.90	35.90	4.00		3-103018225-092903-0001

Completed By:	Date:

All weights are measured in grams

Figure 3-10. Sample Weight Log

3.4.4.4 Return Sample Shipping Coolers

CLP Laboratories must routinely return sample shipping coolers within 14 calendar days following shipment receipt. Therefore, the sampler should also include cooler return instructions with each shipment. The sampler (not the CLP laboratory) is responsible for paying for return of the cooler and should also include shipping airbills bearing the sampler's account number, as well as a return address to allow for cooler return.

3.4.4.5 Label and Seal Sample Shipping Coolers

After samples are packaged within shipping coolers, sampling personnel must carefully secure the top and bottom of the coolers with tape, place return address labels clearly on the outside of the cooler, and attach the required chain-of-custody seals (see Figure 3-11).

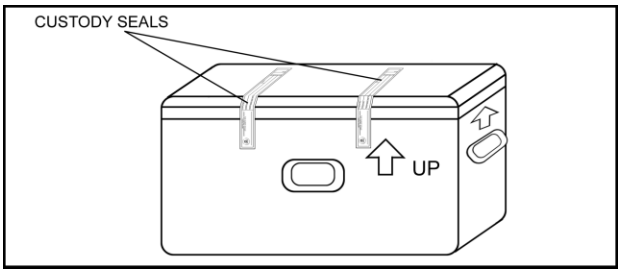


Figure 3-11. Shipping Cooler with Custody Seals

If more than one cooler is being delivered to a laboratory, samplers should mark each cooler as "1 of 2", "2 of 2", etc. In addition, sampling personnel must accurately complete and attach shipping airbill paperwork for shipment of the samples to the laboratory. An airbill, addressed to the Sample Custodian of the receiving laboratory, should be completed for each cooler shipped. Sampling personnel should receive the correct name, address, and telephone number of the laboratory to which they must ship samples from the Region/RSCC Coordinator. To avoid delays in analytical testing, sampling personnel should make sure they are sending the correct types of samples to the correct laboratory when collecting samples for multiple types of analysis. For example, inorganic samples may be shipped to one laboratory for analysis, while organic samples may need to be shipped to another laboratory.

3.4.4.6 Ship Samples

The sampling contractor should ensure that sampling personnel know the shipping company's name, address, and telephone number. In addition, they should be aware of the shipping company's hours of operation, shipping schedule, and pick-up/drop-off requirements.

Overnight Delivery

It is imperative that samples be sent via overnight delivery. Delays caused by longer shipment times may cause technical holding times to expire, which in turn may destroy sample integrity or require the recollection of samples for analysis.

Saturday Delivery

If shipping samples for Saturday delivery, the sampler **MUST** contact the RSCC Coordinator (or their designee) or CLP SMO by 3:00 PM ET on the Friday prior to delivery.

3.4.5 Provide Shipment Notification

When samples are shipped to CLP Laboratories, sampling personnel **must immediately** report all sample shipments to the RSCC Coordinator (or their designee) or to CLP SMO. **Under no circumstances should the sampler contact the laboratory directly.** If sampling personnel are shipping samples after 5:00 PM ET, they must notify the RSCC Coordinator (or their designee) or CLP SMO by 8:00 AM ET on the following business day. Sampling personnel should receive the name and phone number of the appropriate CLP SMO coordinator to contact from the Region/RSCC Coordinator.

Samplers must provide the following information to the RSCC Coordinator (or their designee) or to CLP SMO :

- Name and phone number at which they can easily be reached (preferably closest on-site phone number if still in the field);
- SMO-assigned Case Number (see Section 2.4.1);
- Number, concentration, matrix and analysis of samples being shipped;
- Name of laboratory (or laboratories) to which the samples were shipped;
- Airbill number(s);
- Date of shipment;
- Case status (i.e., whether or not the Case is complete);
- Problems encountered, special comments, or any unanticipated issues;
- When to expect the next anticipated shipment; and
- An electronic export of the TR/COC Record (must be sent within five days of sample shipment). For information regarding electronic export of TR/COC Records, refer to the following Web site:

  http://www.epa.gov/superfund/programs/clp/f2lsubmit.htm

Note: For Saturday delivery, samplers MUST contact the RSCC Coordinator (or their designee) or CLP SMO by 3:00 PM ET on the Friday prior to delivery.

Samplers should be aware if their Region requires them to notify the RSCC Coordinator (or their designee) and/or CLP SMO of sample shipment.